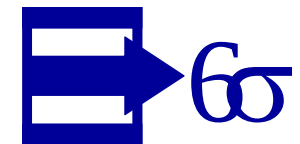
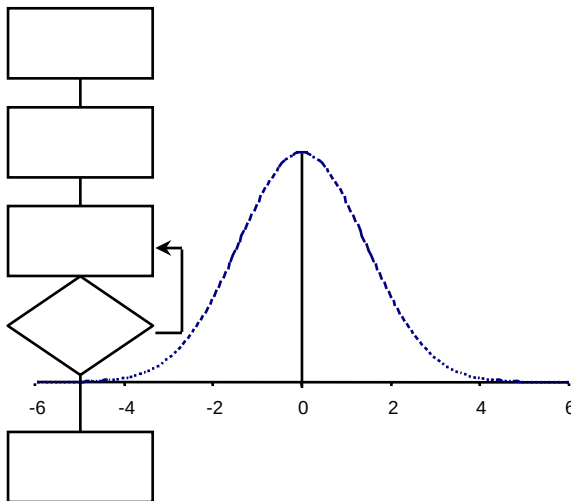


Black Belt – Role & Orientation ***"We're Not in Kansas Anymore"***



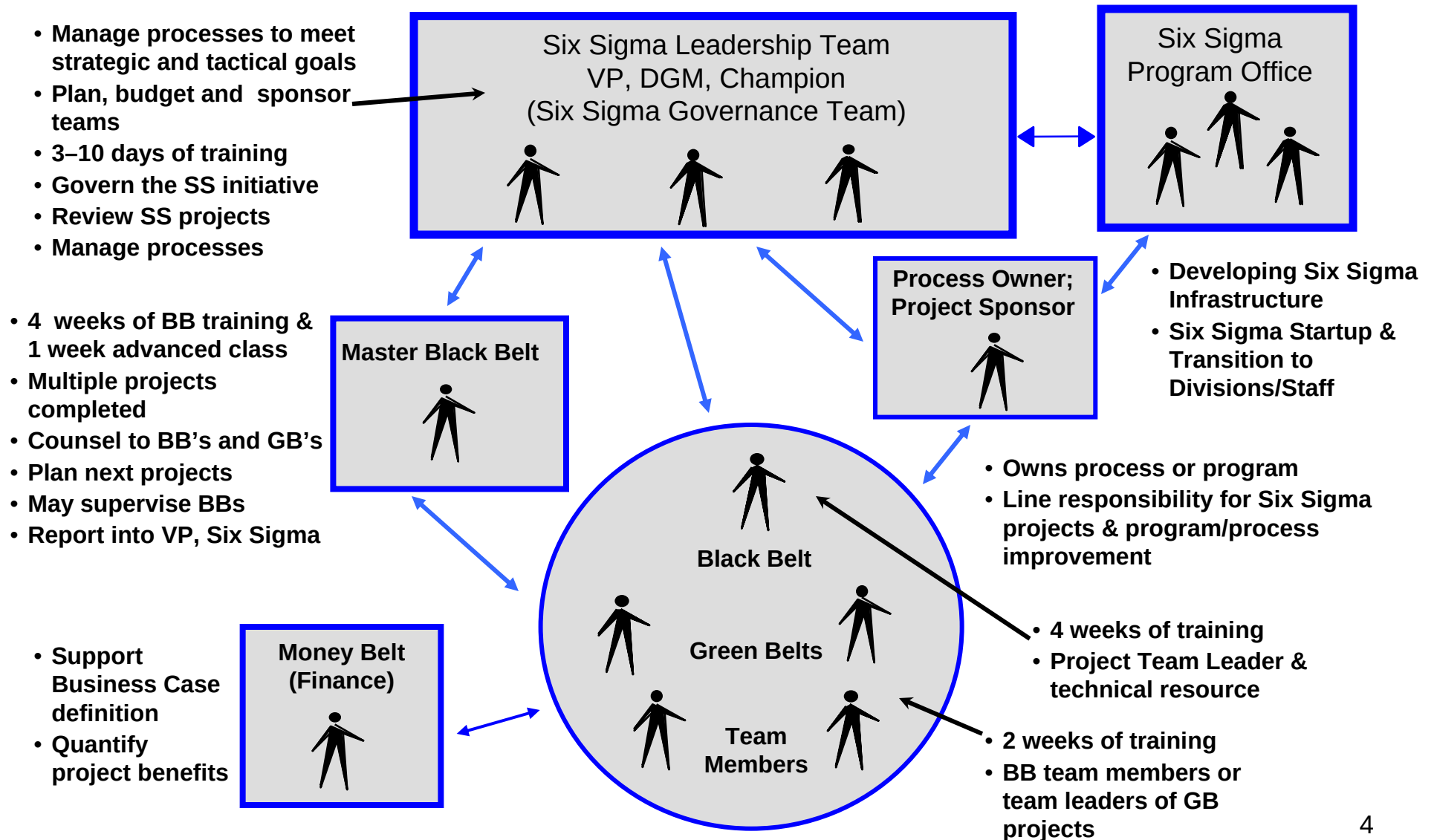
Objectives

- Step Back and Provide the "Trained" Black Belt with the Big Picture on Six Sigma & Their Role

Six Sigma Roles & Responsibilities

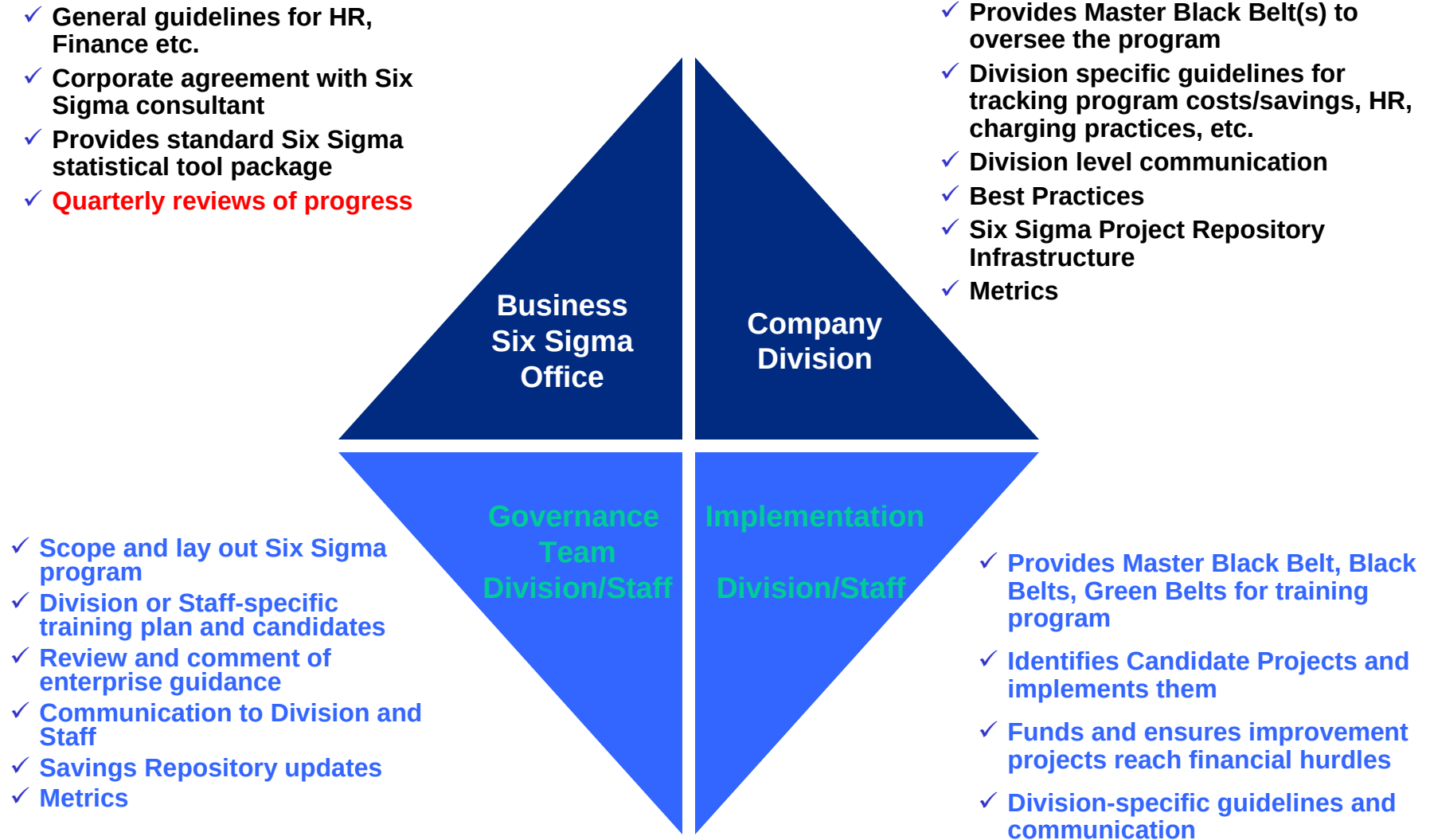
Six Sigma Organization

MSCC Six Sigma "Belt"



Company Roles & Responsibilities

MSCC Six Sigma "Belt"



Black Belt – Criteria & "Tour of Duty"

- **Nomination Criteria**

- Top 20%, Level 1 or on the MRR

- Exempt MTS – OIP III

- Promote-able

- Process Oriented

- High energy

- Demonstrated leadership (12, 13, OIP4)

- Must want to step up and make a difference

- **Assignment Description**

- Full-time, two year assignment

- Project leader

- Team of 5-8 Green Belts working 20 - 25%

- Four weeks of training

- Options (based upon selection) for Master Black Belts

- Trainer

Black Belt Core Competencies

- Core Competencies

Master Six Sigma Thinking (Analytical Skills)

Ability to Shape & Execute Company Strategy

Financial Acumen (Business Insight)

Project Management Skills (Problem Solving/Results Orientation)

Ability to Negotiate and Influence Others

Communication Skills

Ability to Manage and Lead Change

Ability to Build High-Performing Teams

Develop/Improve Training Skills and Techniques (as appropriate)

**Black Belt – Selected Not Just to Lead Projects,
But To Lead Your Organization**

What is Expected of a Black Belt?

Learn/become expert in the methodology and approach

- In class, in application, and in self-directed learning
- The learning project and future projects

Deliver business results through high-impact projects

- Jointly accountable with champion for defect reduction and financial results

Change leadership: Ambassador for Six Sigma

- Influence business unit/functional leadership
- Influence peers
- Influence front line
- Facilitate organizational change to “operationalize” Six Sigma

Help shape Six Sigma for Your Company—truly a chance to become an architect of your/our future!

What is Expected of a Black Belt?

How Many Projects, How Much Money???

- Annualized financial return of at least \$750K (less if you are a Six Sigma trainer)*
- Identify additional opportunities totaling at least \$1M*

Typical Numbers:

\$100K - \$200K per project (\$50K for Green Belt project)

2-4 to 1 Payback on Investment (training, Black Belt costs, etc.)

8-12 projects per year

“Benefit” – to Company or the Customer

*Is it “Better” to Accomplish One Project Worth \$1,000,000
or 10 Projects Worth \$100,000 Each?*

BB Certification

- Minimum 4 weeks of training
- One completed project
- Demonstrated competency with statistical tools
 - May use post-training competency exam
- Some Black Belts will become Green Belt trainers
 - At most ½-time role

- Develop Six Sigma Strategy for their Division/staff function
- Customer Interaction – Develop strategy to engage the customer in supporting Six Sigma projects (direct charge)
- Review Six Sigma projects within their area
- Identify
 - Black Belts within their organization
 - Six Sigma Projects (Strategy Gap Analysis)
- Benefits from the projects
 - Validation that Benefits are achieved
- Communication of success stories and Six Sigma strategy for own area
- Reporting of Six Sigma results
 - Six Sigma to be incorporated in our standard business processes
- Personal Participation
 - ✓ Attendance at a GB training class, doing a project
- Incentive Plans
 - Reflected in OIP, MIP and TAP goals

Six Sigma Governance

Division Champions

- Individuals reporting directly to Division President
- Responsible for shaping Six Sigma program to fit division needs
- Responsible for promoting Six Sigma within the division

Staff Champions

- Ditto – but for staff organizations (law, sales, HR, engineering, etc.)

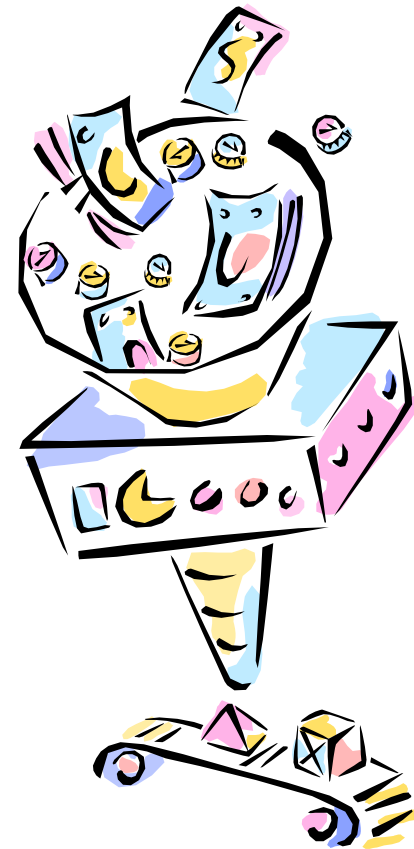
Critical players to shape Division/Staff Six Sigma program, identify MBB/BB/GBs, validate projects, and determine financial policies

The Project Sponsor Role

- Line or Staff Management who:
 - Owns the Business Process
 - Is Responsible for Improving Business Performance
- Identifies Process Improvement Opportunities – Six Sigma Projects
- Deploys Resources (BB, GB) for Six Sigma Project Teams
- Periodically Reviews the Project
- Approves Resources Required for Implementation of Project Recommendations
- Has "Skin in the Game"

Money Belts

- *Consultants* to help Black and Green Belts shape their initial business case; validate financial benefits from projects



Black Belt Characteristics

MSCC Six Sigma “Belt”

- Job Title: Black Belt
- Location: Assigned company location
- Reporting to: Functional VP/Director in current Division/Staff Function; dotted-line reporting to VP Six Sigma
- Grade/Job Level: Determined by Division; with concurrence from VP Six Sigma
- Job Duration: Minimum of 18 months - 2 years, full time

Job Description

Job Profile:

- Lead multiple Six Sigma projects per year, each delivering an significant bottom-line improvement
- Lead, train and mentor Green Belts and network with peers in the use of Six Sigma tools and techniques
- Facilitate in the selection of Green Belt projects
- Support Six Sigma training activities, as required
- Carry out other duties and tasks, as requested, by the Functional VP/Director or VP Six Sigma.

Personal Characteristics:

- Complete Black Belt training
- Achieve Black Belt certification as determined by Six Sigma project office – Black Belt certification requires the successful completion of one project
- Self-starter who can work on own initiative with minimum supervision
- Effective communicator, at all levels
- Able to influence and lead teams; effectively able to work at multiple levels within the organization
- Able to use the full range of Six Sigma tools – e.g., simple brainstorming, detailed statistical analysis of data, use of statistical software (e.g., Minitab)
- Computer-literate and competent in mathematics and elementary statistics
- Ability to lead, train, mentor, and work in a team
- Energy, enthusiasm, with a passion for excellence
- Potential to develop within Company

Master Black Belt Characteristics

MSCC Six Sigma “Belt”

Job Title:	Master Black Belt
Location:	Per assigned Division
Reporting to:	VP Six Sigma and/or VP/GM or Staff VP
Grade/Job Level:	Determined by Division
Job Duration:	Minimum of 2 years, full time

Job Profile:

Support improvement activities at locations, and at suppliers & customers, as required; work on overseas assignments for short periods

Provide mentoring and support, as required, to Black Belts, Green Belts – coach local teams to use the improvement tools appropriate to the problem

Master Six Sigma theory and application; able to train/coach others within TRW and with customers/suppliers, as required

Liaison, as required, with external agencies in the delivery of Six Sigma training

Promote and support improvement activities in all business areas – manufacturing, engineering, services, finance, PR, HR

Network with other Master Black Belts

Execute other duties and tasks, as defined by the VP Six Sigma

Personal characteristics:

Certified Six Sigma Black Belt, and Complete Master Black Belt training, or demonstrate completion of a similarly structured program

Educated to degree level or equivalent

2+ years experience or thorough and proven working knowledge of Six Sigma

Technically strong in mathematics, statistics and use of statistical software (e.g., Minitab)

Willingness to embrace change and new ideas

Tough, resilient, and able to persuade others

Able to work at multiple levels within the organization; politically savvy

Energy, enthusiasm, with a passion for excellence

Proactive leadership style; able to communicate at all levels

Ability to promote the key messages of pace, results and sustainability in all activities

Able to quickly grasp the bigger picture of business drivers and infrastructure

Ability to build consensus, and work collaboratively as part of the world-wide Six Sigma team

Ability to travel as required depending on business needs

A Day in the Life of a Black Belt

A Typical Black Belt's Day

Stakeholder Analysis With HR Team

Meet with Green Belts – Cause & Effect Diagram

Brown-Bag Lunch – SIPOCs & You!

Discuss New Charter with Champion

Help DGM Understand Control Charts on Their Dashboard

MBB Project Review (AGAIN!)

Analyze Project Data – Minitab Time!

Prep for Next Week's Green Belt Class

Customer Discussion – Potential Project Ideas

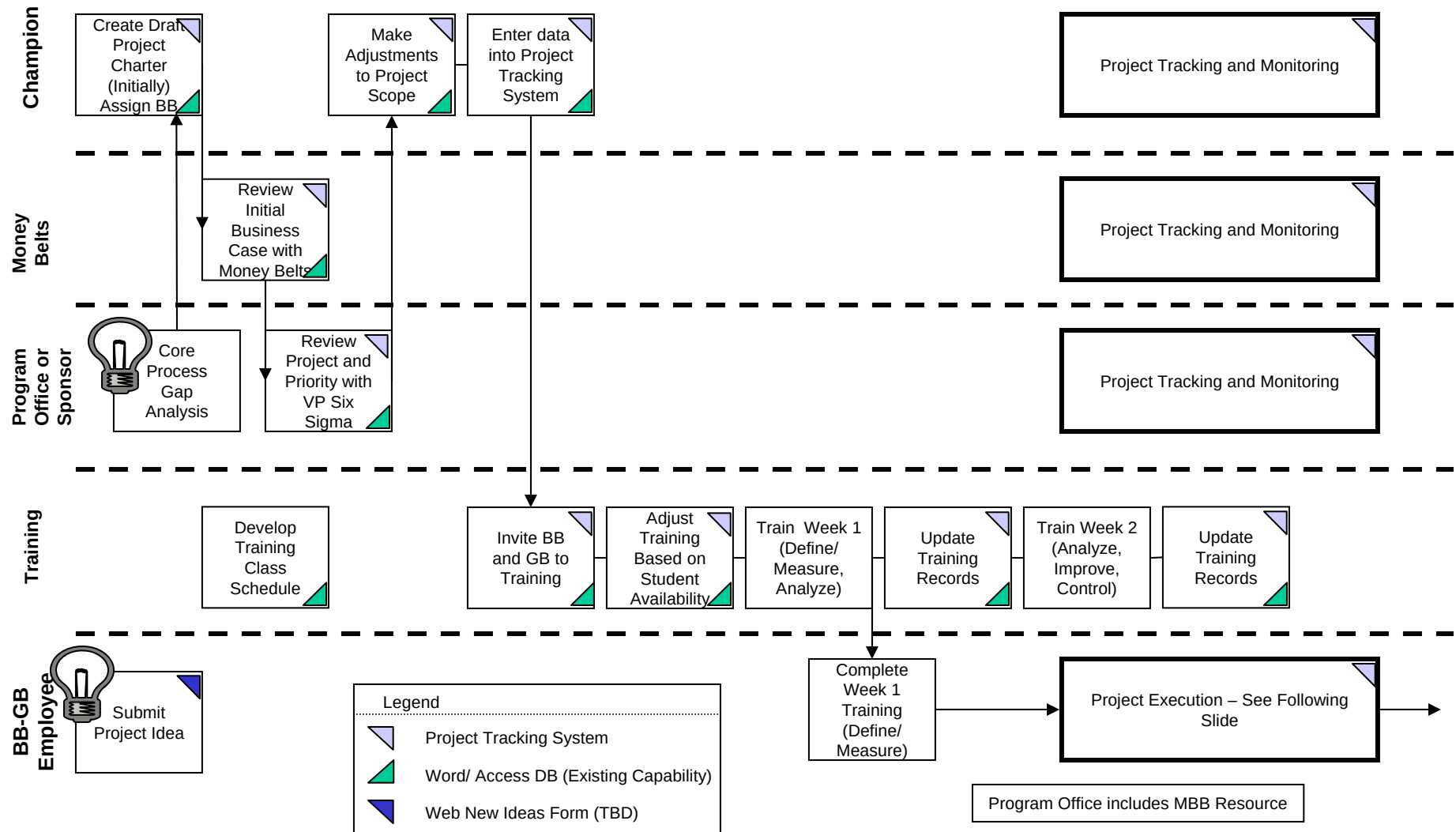
- First Project(s) - an opportunity for an “early win”
- Your chance to learn and apply the Six Sigma methods & tools
- Your opportunity to lead a team of Green Belts to success
- General project criteria:
 - Narrow Scope
 - “Single CTQ”
 - Solution not pre-defined
 - 4 – 6 Months from Define to Improve
 - Important (but not too!) financial benefit
 - DMAIEC preferred to DFSS

- Projects should link to Company/Divisions Strategy and/or Improvement of Core or Enabling Processes (*later*)
- Most Projects should be direct charged to customer program
- Project selection criteria will include a requirement to identify a 2 - 4:1 benefit to cost ratio prior to approval (results in a “significant” business case - \$100K- \$200K benefit/project)
- Significant investments in Six Sigma projects and/or implementing Six Sigma project recommendations will be reviewed in the same way as current investment proposals
- Financial definitions related to hard and soft savings, payback periods, indirect rate impacts, etc. are developed

- Draft the Project Charter (work with Sponsor, Champion)
- Meet with “Money Belt” to clarify business case – *You should be able to “show the money” by the end of Define Step!*
- Select Green Belts (trained? – if no, schedule)
- Meet with Team to clarify, revise charter
- Get to know your MBB
- Develop your project strategy (DMAIEC, DFSS, “DMA-MA”, parent-child, normal, accelerated – *your MBB should help here*)
- Gather early “useful” information:
 - Process definition (flowcharts, procedures)
 - Performance data
 - Previous analyses
 - “Inventory” recent and planned improvements/changes

Project Process Flow – Getting Started

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- Key Reasons for Business Case Development:
 - Ensure YOUR valuable resources are being employed to the best advantage
 - Communicate importance of project to management (Dr. Juran – “Management speaks in the language of money”)
- How:
 - Identify the Finance “Money Belt” for your Division
 - Identify Dollar Savings, Cost Avoidance, Revenue Enhancement opportunities and quantify (not always easy!)
- Some Business Case “Myths”
 - The Benefit has to be a *Savings to the Company*
 - The Project has to be worth *at least \$150K*
 - If I do a Design for Six Sigma project, I don’t need a Business Case

Project Charter Lookup

Create a Six Sigma Project Data Base (or "Piggyback" onto Existing Project Management System:

Project Name	Description	Division	Sponsor	Team Leader	Benefit	Status
Leakers	Reduce Braze Leaks at Final Inspection	Chillers	A. Ruben	F. Mathas	\$175k/Year	In Analysis

- Key Interaction Points During the Project (see *Tracking, Reporting, & Reviews*):

DEFINE Step: Building the Business Case (previous slide)

MEASURE Step: Revisit the Business Case after developing “Focused Problem Statement”

IMPROVE Step: Trade-Study, Cost-Benefit Analysis for Proposed Changes

CONTROL Step: Measuring and Validating the Project Benefits

- Finance provides the support; you are responsible for the “DO.”

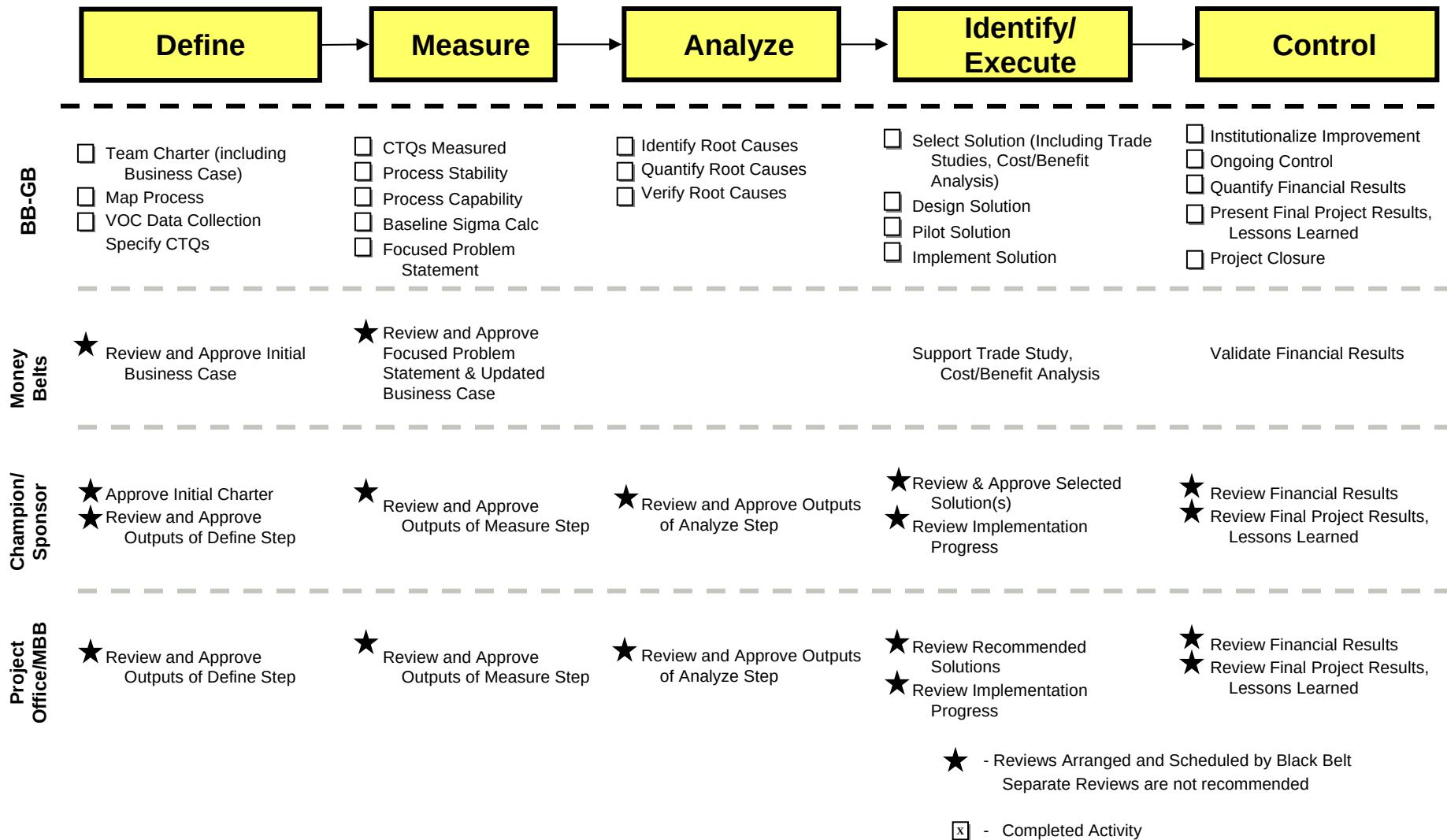
- Share the Vision – Why is This Project Important? (Charter “Buy-in” – Before Training)
- During Their Training – Check-in, Make Sure They Don’t Go to Mars If The Charter Says Venus (*1st Day Training Presence*)
- Use their Subject Matter Expertise (You may not be the SME!)
- Delegate Project Work As Much As Possible (GE BB Mistake – Doing 80% of the Work)
- Use Team Meetings to Review Work, Make Decisions, Plan Next Steps
- Help Them Learn DMAIEC Method/Tools – They will Lead a Team Next
- Dealing with Remote/Geographically Dispersed Teams – Ideas?
- Share the Glory!

- “The Next Generation” – Green Belts leading/doing Six Sigma projects; Next Group of Black Belts (*Bridging*)
- INSIST on a Project Plan; Update Frequently
- Periodic “Pulsing” of their Efforts
- Reviewing Green Belt Project Output
- Help Them Grow in Tools, Methods Use (Don’t Hog All the Minitab Fun!)
- What if the Green Belt is Not Helping the Team Progress?

- Stakeholder Analysis – Do Upfront in DEFINE Step, Update Often
- Selling Your Project
- War Rooms
- “All the People in the Process are on the Team; It’s Just that a Few Get to Attend the Meetings”

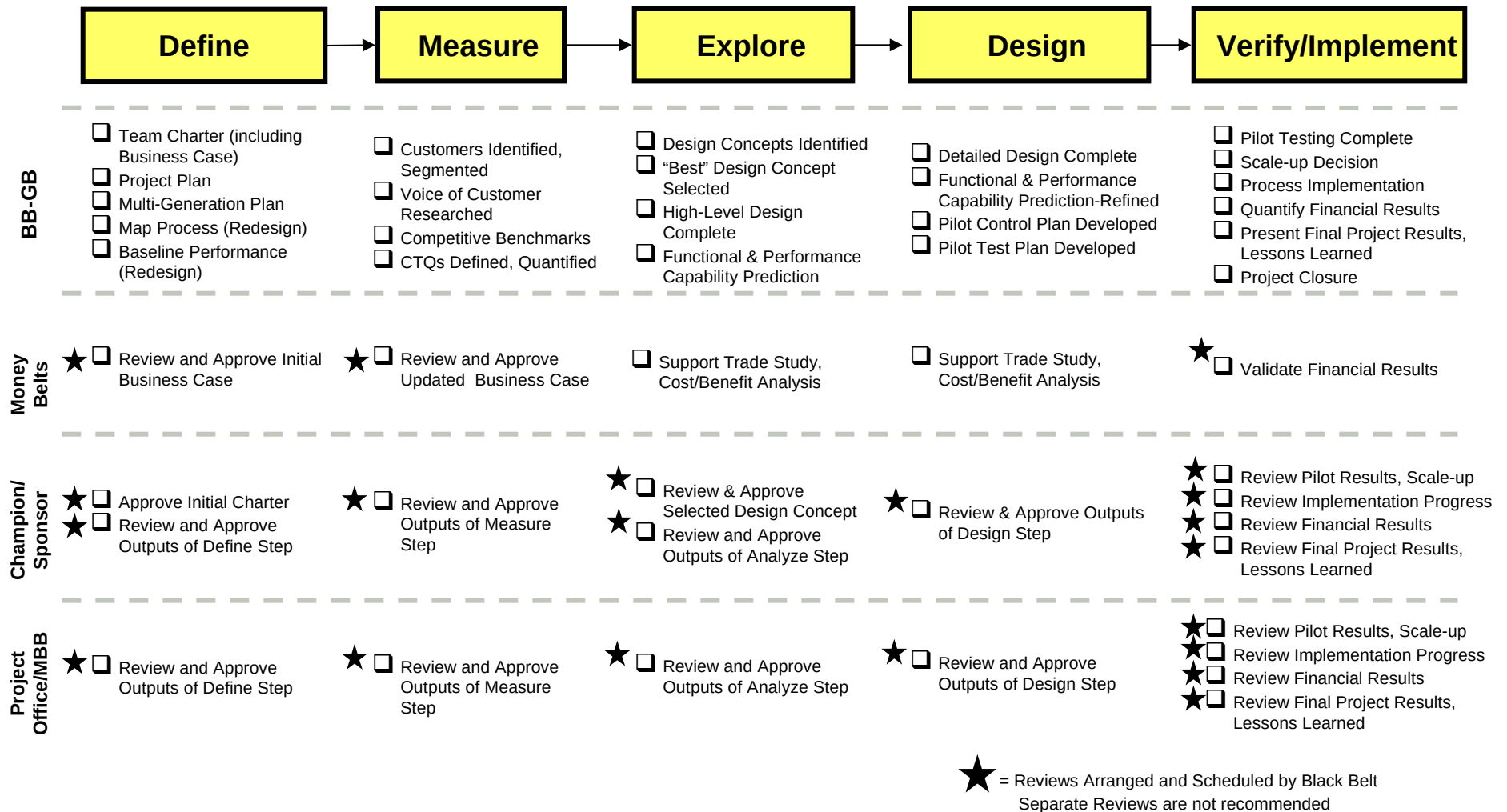
DMAIEC Project Flow & Reviews

MSCC Six Sigma "Belt"



DFSS Project Flow & Reviews

MSCC Six Sigma "Belt"



Project Review Templates

- Review templates are available for both DMAIEC and DFSS projects. Use these to present your projects to Champions, MBBs, Process Owners:

DMAIEC Project Review Template

Project Name:
Black Belt:
Project Sponsor:
Champion:
Date:

1

Design for Six Sigma - DMEDV Review Template

Project Name:
Black Belt:
Project Sponsor:
Champion:
Date:

2

Keep Your Eye on the Business Case

- When to Consider Re-scoping or Killing a Project:
Evaluation of the Business Case Says It's Not Worth It!
Another Effort will Supercede Your Project
Your Champion/Executive Leadership/Sponsor Changes
Killing a Project Is *NOT* a Bad Thing!

Promoting Six Sigma

- Tom Sawyer and Painting the Picket Fence
- Sharing Your Project (Completed Review Templates, Speaking Opportunities, Beware the “Six Sigma Poster Project”)
- Actions vs. Words
- Working with Champion/Process Owner – Strategy, Metrics, Gap Analysis, Project Identification
- Sign-up to Teach “Belt” Classes (Your Stories will Go 1000X Farther than the Expensive Consultant’s)

- MBB's Assigned to Each BB (see Assignment List)
- Support to Plan Your Specific Project (Adapting DMAIEC, DFSS)
- Who to “Go-To” When You have a Technical Problem (“I’m not sure how to set up a Logistical Regression Analysis”, “So, really, why *is* Curling an Olympic Sport?”)
- Help when various forms of resistance are observed – technical, political, cultural
- Expect the MBB to actively mentor you
- Role initially performed by external consultants & hires; need to grow Company expertise

- Strategize with Your Team, Your MBB
- Use Chain of Command – BB to Project Sponsor, Champion
- The Six Sigma Program Office will also help!

Multiple Choice Question - Projects are completed when:

1. The Process Changes are identified and funding issues are resolved
2. The IT organization has accepted responsibility to make the changes
3. The Process Changes are implemented
4. I can't charge to the project anymore
5. After the change, the first data point is lower/higher than the last pre-change data point
6. The Process has shown measurable, sustained improvement
7. The projected savings/revenue enhancement from the project have been realized
8. My VP or Process Owner says it is done
9. All of the above

Define “Exit/Success” Criteria in the Project Charter

There's Lot's Out There

MSCC Six Sigma "Belt"



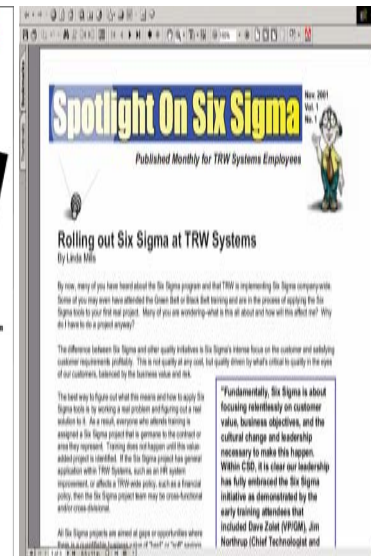
Web site



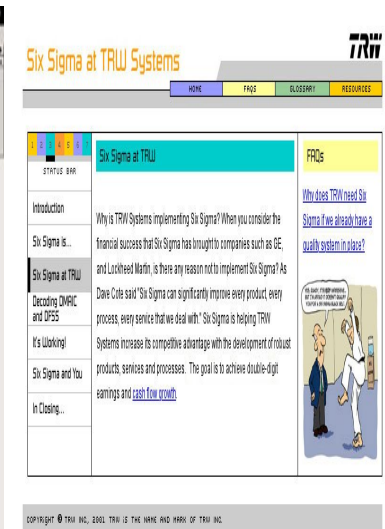
BB
Handbook



GB Primer



Monthly
Newsletter

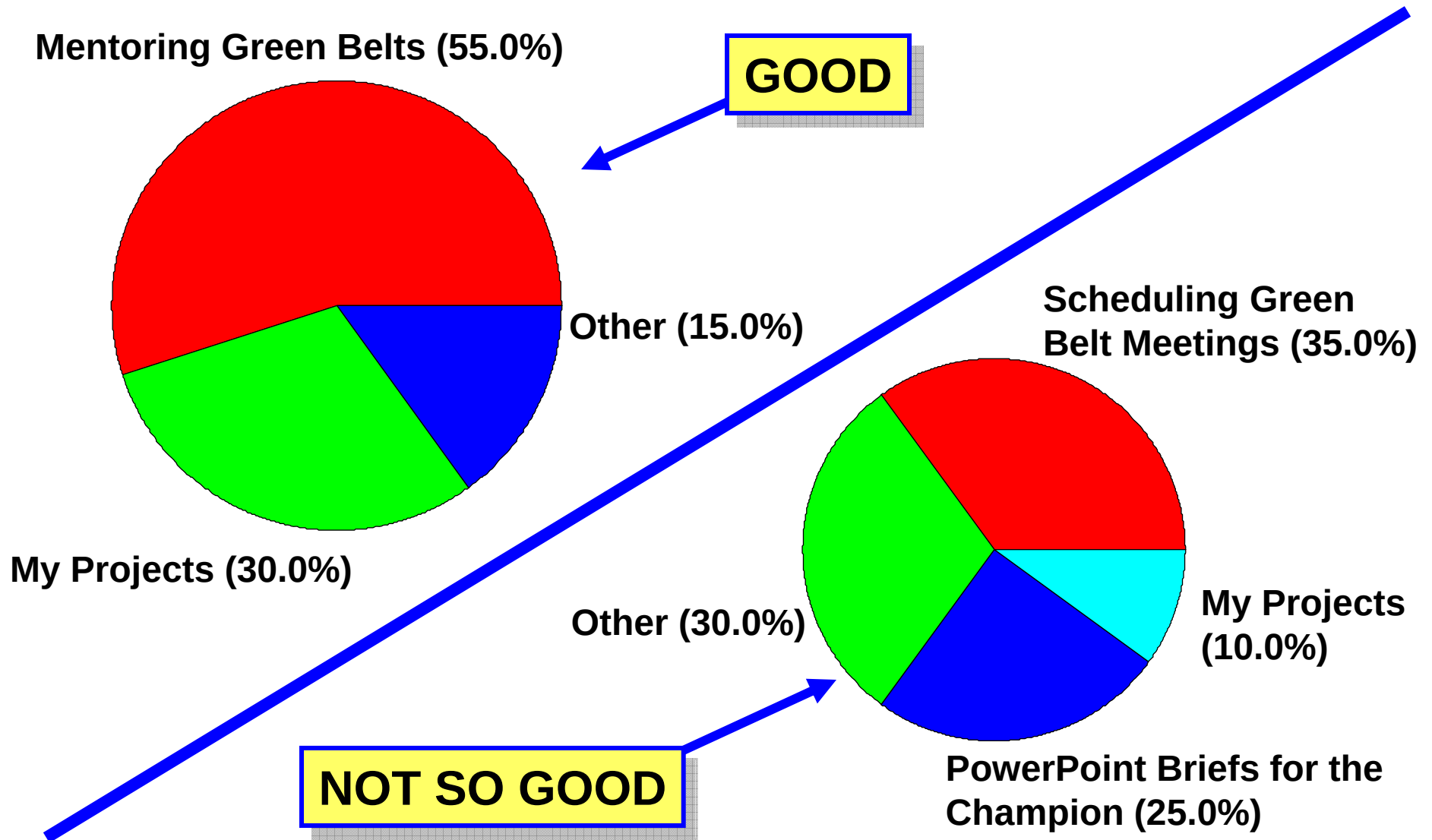


Awareness
Training

Tools to develop and reinforce a Six Sigma "culture" across our geographically dispersed organization.

Allocating Your Time

MSCC
Six Sigma "Belt"



- Elements to Consider:
 - Leadership & Change Management
 - Customer-Focus
 - Decision Making
 - Business Insight
 - Statistical/Analytic Skills
 - Respect, Trust, Communication
 - Business Partnerships

How Well Do I . .

- *Challenge the status quo*
- *Effectively influence others to embrace change*
- *Overcome change resistance*
- *Seek out outstanding ideas whatever their source and implement them*
- *Create Results-Oriented Teams*
- *Clarify Roles, Responsibilities & Objectives*
- *Establish Team Expectations*
- *Encourage Teams and Provide Support*
- *Monitor Team Performance*
- *Empower/Delegate*

Customer Focus –

How Well Do I . .

- *Recognize and incorporate key customer needs into solution delivery*
- *Approach issues through the eyes of the customer*
- *Clarify Mutual Understanding of Customer Needs*
- *Maintain Customer Trust*
- *Gain Agreement*
- *Follow Up*

Decision Making –

How Well Do I . .

- *Seek Information*
- *Organize Information*
- *Develop and Consider Alternatives*
- *Gain Commitments*
- *Act Decisively*

How Well Do I . .

- *Demonstrate broad understanding of our business*
- *Understand the implication of key financial indicators (i.e., financial reports, cost drivers, market opportunities)*
- *Use financial information to assess the impact or viability of alternate processes or actions*
- *Manage Matrix and Alliance Organizations*

How Well Do I Understand and Apply These Tools . .

Define Phase		Measurement Phase		Analysis Phase		Improve/Execute Phase		Control Phase	
Tool	Y/N	Tool	Y/N	Tool	Y/N	Tool	Y/N	Tool	Y/N
Project Status Form		Process Sigma		Process Map		Creativity Techniques		QC Process Chart	
Project Time Line		Control Chart		Pareto Charts		Sample Size Selection		Sample Size Selection	
Team Established		Stratification		Fishbone		FMEA		Process Map	
VOC/CTQ's		Gage R&R		Sample Size Selection		Process Map		Control Chart	
Specifications		Sample Size Selection		Control Chart		Process Sigma		Before/After Pareto	
SIPOC		Pareto Charts		Stratification		Planning Tools		Before/After Frequency	
Charter		Scatter Diagram		Frequency Plot		Hypothesis Tests		Other (List)	
Other		Frequency Plot		Hypothesis Tests		DoE		Other	
Other		Other		Regression Analysis		Control Chart		Other	

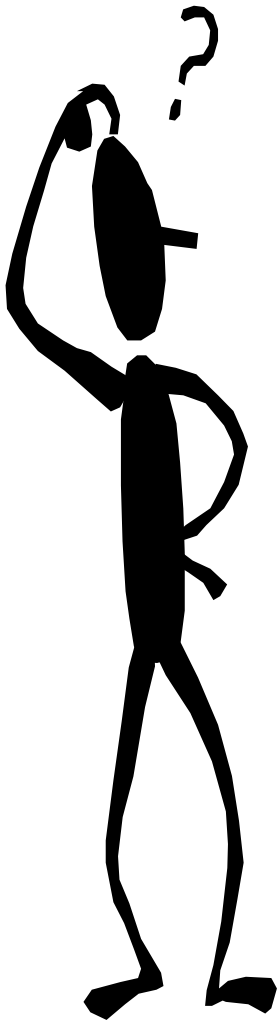
How Well Do I . .

- *Acknowledge Contributions*
- *Support Disclosure*
- *Demonstrate Commitment*
- *Demonstrate Advocacy*
- *Actively Listening*
- *Value Diversity*
- *Demonstrate Inclusive Behavior*
- *Communicate Up and Down the Chain of Command*

Business Partnerships –

How Well Do I . .

- *Identify Opportunities*
- *Establish Shared Goals*
- *Collaboratively Develop Solutions*
- *Influence Actions and Facilitate to Conclusion*
- *Manage Expectations*



You know you've worked in 6 σ too long if....

10. Your kids are called Upper Spec and Lower Spec
9. You start DIY projects by writing a charter and drawing up an project plan
8. You lecture the neighborhood kids selling lemonade on ways to improve their process
7. You know the standard deviation of your daily commute to 3 decimal places
6. You have maximized the yield of your tomato plants with a DOE
5. You find you really need PowerPoint to explain what you do for a living
4. You know that Poka Yoke has nothing to do with breaking eggs!
3. You think Einstein would have been more effective had he put his ideas into a matrix
2. You get a custom license plate that says "SIXSIGMA"
1. When your boss says, can you do my Green Belt project for me?

Black Belt Lessons Learned

- **Don't Sandbag the Stakeholder analysis**

Figure out who you need to bring along

Meet with them frequently, individually and with your team

- **Don't worry if you start to gather too much information**

As you learn more about the process and Critical-to-Quality drivers, your project will appear to grow in scope. This is part of the process. It is OK, you are learning.

Use the FMEA tool to keep you focused on the key problems.

- **Speak Six Sigma only to those fluent in Six Sigma – Translate for the rest of the population**

Don't fling acronyms.

- Avoid: “Our FMEA focused us on the CTQs that we gathered from our VOC.”

Words like “Defect” can insight a riot with stakeholders that think things are really just fine

Remember where you were three months ago....DMAIEC, DFSS, DMADV....

Black Belt Lessons Learned

- **Decide in the first 2 weeks if your project is DMAIEC or DMEDV**

If you can identify improvements by measuring the existing process:
DMAIEC

"Solutions" often masquerade as DMEDV projects ("Develop a database");
re-define by asking "Who are all the customers? What are all their Y's?"

- **Recognize you may need to repeat steps**

E.g., Define – Measure – Analyze (recognize you don't have good data) –
Measure – Analyze – Identify - Execute – Control

- **Restrict the scope to something you can complete in six months**

If you identify additional improvements, spawn other projects

Work with the Process Owner to institutionalize your improvements
(Control)

- **Use reviews to drive the project schedule to completion**

Identify review points, e.g., (1) after Define, (2) mid-project, (3) end of
project

Ask MBB, Money Belt, GBs to review the presentation

Conduct one hour meeting/telecon with Executive Champion, Champion,
Process Owner, Sponsor, MBB, Money Belt, GBs – expect changes!

***Black Belt
HR Guidelines***

Objectives

- Select strong performers who can drive results on projects and train others on Six Sigma concepts
- Develop Six Sigma expertise in geographic areas where TRW Systems has programs and employees

Selection Criteria

- Organization Status
 - Black Belt candidates should have demonstrated performance that "far exceeds" or "exceeds" expectations
- Skills/Competencies
 - Leadership, project management, and analytical skills are essential for the role
 - Ability to train and coach others on Six Sigma tools is also important
- Geographic Location
 - Ratio of Black Belts to exempt employees should be approximately 1:100; where critical mass exists, the appropriate number of local top performers should be considered for Black Belt roles

Reporting Relationships

- Reporting relationships will remain solid line to the Division/Staff Function with addition of dotted line to VP Six Sigma
Important for maintaining Black Belt visibility within “home” organization while still enabling input and oversight by Six Sigma Program Office
Operates much like reporting relationship for HR, Finance, Business Development employee
- Initially, Division/Staff has flexibility to determine BB manager
In most cases, **legacy manager** will remain in place;
Division/Staff Six Sigma Champion, VP/DGM, or other manager may also be appropriate
- Division/Staff Master Black Belts will ultimately serve as Black Belt managers

Performance Management

- New Employee Performance & Development Process (EP&DP) combines performance appraisal, goal setting, and professional development planning into one on-line process
- Black Belts included in Division/Staff hierarchy consistent with reporting relationship
- Six Sigma Office provides input on all aspects of performance management for Black Belts

January '02: Guidance sent to VP/DGMs regarding 2002 performance goals, professional development activities, and future/potential position planning for Black Belts (see Appendix)

YE '02: Six Sigma Office (appropriate MBB, Champion, or other) will provide supplemental appraisal(s) of Black Belt performance

- Collaborative Process

Division/Staff has responsibility to:

- Manage Black Belt compensation—ensuring it remains competitive, encourages and rewards the desired performance, and “makes sense” within their environment

HQ Compensation has responsibility to:

- Provide data on Black Belt compensation levels and trends in our market(s)
- Assist in performing internal/external equity analyses as necessary

Six Sigma Program Office has responsibility to:

- Provide guidelines (e.g., goal “flow down”) where needed, relative to compensation
- Notify Divisions of Black Belt progress toward meeting milestones (certification, project and assignment completion)

On-Assignment Compensation and Rewards

MSCC Six Sigma “Belt”

- Base Pay
 - Adjustments to base pay during the assignment will be handled primarily through the Division/Staff SIF process
 - Off-cycle salary adjustments (outside of the SIF process) are available
- Variable Compensation
 - Key feature of Black Belt’s total compensation package; enables TRW Systems to incentivize outstanding performance on Six Sigma projects, reward high visibility of Black Belt role, and keep base pay “in line” for future positions

Non-OIP/MIP Black Belts

Task Achievement Program (TAP) awards will be used to establish Six Sigma project-related goals and reward outstanding performance on an annual basis

Eligibility for Operational Performance Plan (OPP), Specials, STARS, and other existing R&R programs continues during assignment

OIP/MIP Black Belts

Goals will “flow down” from VP Six Sigma and VP/DGM’s Six Sigma goals

Payouts determined through normal year-end process (with input from VP Six Sigma beginning in 2002)

Stock option grants continue to be available

- Management Resource Review (MRR)

Black Belts included in Division/Staff MRR presentation and discussion

VP Six Sigma prepares separate MRR presentation for Six Sigma initiative

- Identifies BBs for promotion to MBB role
- Identifies candidates for VP Six Sigma role

- Additional Succession Planning / Placement Strategies

Encourage Black Belts to work projects outside of home Division/Function to grow professional network and gain cross-business experience

Existing resources function as informal mentors on career development

Structured placement activities begin 6 months before assignment ends

- **6 months out:** Six Sigma office notifies appropriate VP/GM, HRD, and Champion
- **4 months out:** Division/Staff responds with placement options for Black Belt
- **3 months out:** If placement options not available within “home” Division/Staff, VP Six Sigma assists in locating opportunities within TRW Systems

Six Sigma and Financials

Agenda

- Financial Benefit
- Standards and Definitions
- Roles and Responsibilities
- Validation and Measurement

Financial Benefits

- "In order to deliver the expected payoff to the business, it is critical that we select Six Sigma projects that are capable of producing significant financial benefits"- J. Greatorex, Black Belt
- All projects, direct and indirect, strategic, hard and soft, DMAIEC and DFSS, engineering process, accounting transaction, etc, must create financial benefits now or in the future
- Company has developed target benefits for each project
 - This achieves industry standard of 2-4:1 savings
 - Recovers training and program office costs +
- Black Belts, Champions, and Money Belts have key roles in estimating and validating project benefits.

Company Metrics

MSCC
Six Sigma "Belt"

Detailed Financial Forecast									
	Potential Net Benefit	Sales Increase	Gross Benefit		Costs Required		Net Benefit		
Line Item Detail			Hard	Soft	Hard	Soft	Hard	Soft	PBT
2002 Direct Labor/RPE									
2002 Direct ODC									
2002 Direct Material									
2002 Direct Subk									
2002 TRW OH Labor/RPE									
2002 Other OH Costs									
2002 TRW G&A Labor/RPE									
2002 Other G&A Costs									
2002 Capital									
2002 Working Capital/Receivables									
2002 Other Assets									
2003 Direct Labor/RPE									
2003 Direct ODC									
2003 Direct Material									
2003 Direct Subk									
2003 TRW OH Labor/RPE									
2003 Other OH Costs									
2003 TRW G&A Labor/RPE									
2003 Other G&A Costs									
2003 Capital									
2003 Working Capital/Receivables									
2003 Other Assets									

Metrics Definitions

<u>Potential Net Benefit</u>	Initial estimate of Six Sigma project benefits following project charter and initial business case development
<u>Sales Increase</u>	Revenue changes due to implementation of Six Sigma projects
<u>Gross Benefit</u>	
Hard	Identifiable changes in the cost of operations due to Six Sigma project implementation. Savings can result from headcount reduction, changes to planned expense for an ongoing activity, lower investment in capital, etc.
Soft	Productivity improvements not immediately identifiable to hard cost reductions, expense reduction/cost avoidance, reductions in forecasted capital expenditure
<u>Costs Required</u>	
Hard	One time expenses associated with implementation of Six Sigma project recommendations, including SW/HW purchases, system development, addition training, etc.
Soft	Additional effort required by existing staff to implement soft benefit implementation
<u>Net Benefit</u>	Benefit calculated from Gross Benefit minus Costs Required
<u>PBT</u>	PBT impact as a result of Six Sigma project implementation. PBT impact must be identifiable in Profit EAC rate change or other direct profitability impact.

Metrics Definitions

Line Item Descriptions

Direct Labor/RPE	Contract labor and RPE burden
Direct ODC	Other Direct Costs charged to projects (travel, etc)
Direct Material	Materials/Procurements charged to projects
Direct Subk	Subcontracts/Purchased labor charged to contracts
OH Labor/RPE	OH Pool indirect labor and RPE burden
Other OH Costs	Other OH Pool indirect costs
G&A Labor/RPE	G&A Pool indirect labor and RPE burden
Other G&A Costs	Other G&A Pool indirect costs
Capital	Capital expenditures in indirect pools or by IS service centers
Working Capital/Receivables	Changes in Short-term assets, receivables, and payables as a result of Six Sigma actions
Other Assets	Changes in other assets as a result of Six Sigma actions

Six Sigma Program Savings/Benefits

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	Hard	Soft
Immediate	• Additional Customer Sales • Cost Reduction • Asset Reduction (Working Capital; Capex) # 1 Priority	• Cost Avoidance • Avoided Working Capital • Avoided Capital Expenditures • Customer Goodwill Important in containing Capital Investment and Cost Growth; Strengthening Customer Relations
Long-Term	• Additional Customer Sales • Cost Reduction • Asset Reduction Critical to sustaining Cash and Earnings Growth	• Opportunity savings – Freeing up floor space – Removing process time – Simplifying a process • DFSS benefits (future designs) Positioning for the Future

Project Objectives

- Established hurdle values for all Six Sigma Black Belt projects:
 - \$150K of cost savings
 - \$1M of cash flow improvement
 - 2 to 1 savings on projects that directly impact Profit Before Tax
- Each Six Sigma project will be evaluated on its potential to achieve these standards
 - Projects with less financial benefit than standard are NO-GO
 - Projects can have a variety of benefits (cost savings, cash flow, profit), these projects should be evaluated as the combination of the potential benefits vs standard

Financial Benefit Objectives Summary

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Benefit Type	\$'s	Definition	Example
Cost Savings	\$150K/project (Cost = labor+RPE+ODC/OIC)	Cost reduction or cost avoidance on contract or indirect activity	Lower S/W development costs vs bid, reduced headcount, cost avoidance on future activities
Cash Flow	\$1M/project	Balance sheet changes (receivables, payables, capital expenditure) that result in cash flow improvement	Receivables reduction, payables increase, capital expenditure reduction
Profit (PBT)	2-1 Savings/project	Profitability impact on contract...must change contract EAC profit rate	Direct impact on Award Fee Cost reduction on FP contract

Roles & Responsibilities

- **Champion**

- Assist in selection of team members

- Helps define strategic direction and scope for the team

- Helps define the key opportunities available for a successful project

- **Black Belt**

- Define metrics that support project including the specific process for baselining and tracking of metrics

- Establish business case for project

- Ensure milestones are met by team members

- Responsible for ongoing tactical management of team's work

- Updates tracking of metrics and financials

- **Money Belts**

- Provide guidance on establishment of metrics and financial savings opportunity

- Approve initial business case and revisions to assumptions and methodologies

- Responsible for validation of financial benefits accomplished and subsequent audit of savings

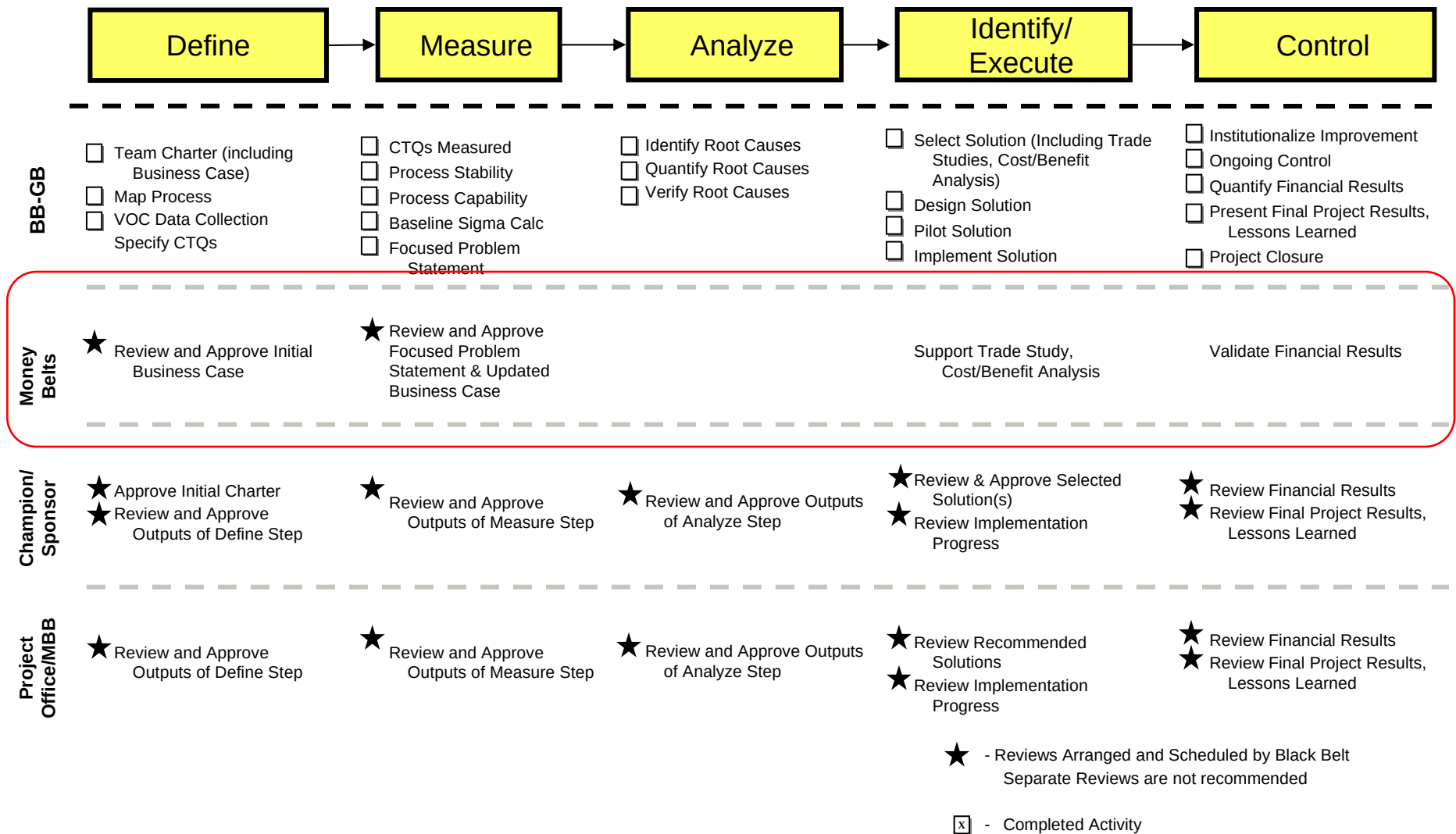
- Assist Champion in idea generation for new projects

Money Belt Roles & Responsibilities

- **Money Belts have day-to-day and strategic roles**
 - Assistance development of business case and approval of Six Sigma project financial benefits
 - Provide direction to Division/Staff on new project idea generation
- **Day-to-Day efforts support Six Sigma project performance**
 - Support business case development
 - Approve/modify business cases during project phases
 - Partner with the BB to identify alternative metrics and solutions
 - Make NO-GO decisions related to ongoing projects and project ideas
- **Strategic activities will generate quality projects to the Six Sigma pipeline**
 - Work with Champions and Black Belts to develop new projects, promote parent-child projects
 - Integrate Division strategy with 2002 goals and objectives (cash flow and profitability)
 - Improve the Finance function's processes, systems and people
- **Communications with Division and Staff Finance organizations on project status, best practices, etc**

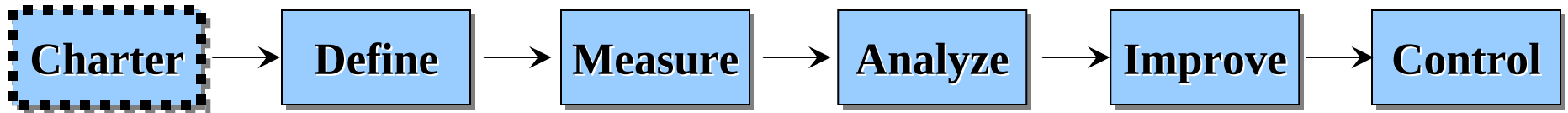
DMAIEC Project Flow & Reviews

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\$Belt Role Through the DMAIEC Process

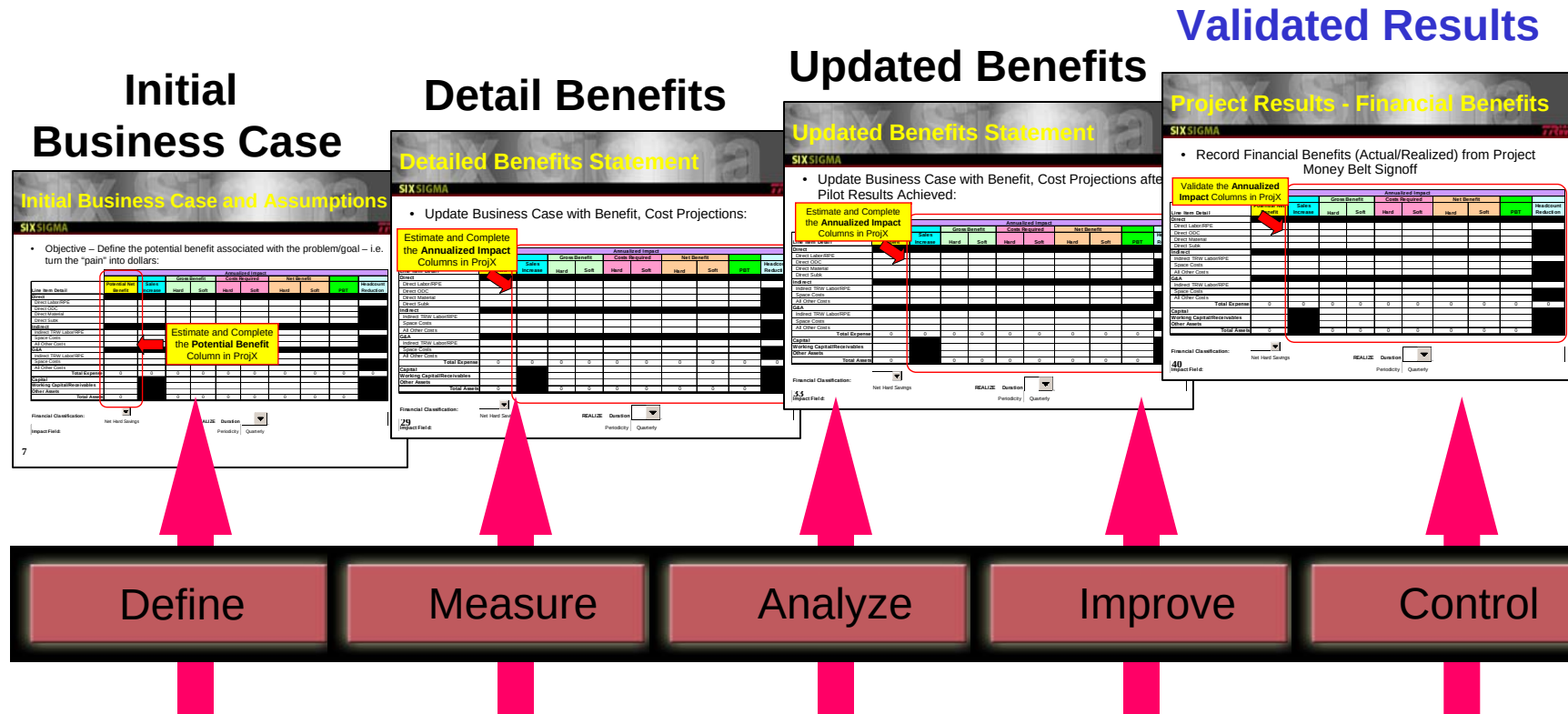
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- | | | | | | |
|--|---|---|--|---|---|
| <ul style="list-style-type: none"> • Process owner, Champion, BB, MBB, \$B define problem, scope and preliminary business opportunity | <ul style="list-style-type: none"> • SS Team Refines scope and develops initial business case • BB & MBB review preliminary financial impacts • \$Belt reviews and approves business case and potential benefits • BB and \$Belt enter Potential benefits into database | <ul style="list-style-type: none"> • Review and approve focused problem statement • Determine validity of financial metrics • Assist in the compilation of detailed financial data • Initial detailed business case entered into database | <ul style="list-style-type: none"> • Continue to refine and update business case as necessary | <ul style="list-style-type: none"> • Support trade study/cost benefit analysis • BB and \$Belt review financial forecast with process owner , division F&B director to obtain concurrence on benefits • Budgets/EAC's adjusted to reflect savings • Approved benefits entered into database | <ul style="list-style-type: none"> • BB transitions control phase to process owner • BB and \$Belt, and process owner track and validate actual financial results • Database updated as needed |
|--|---|---|--|---|---|

Money Belt Reviews to Validate Business Case

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Money Belts – The business partner to Champions and Black Belts to ensure

- Projects are supported by a business case
- Have results that can be validated

When Do We Declare Benefits?

- Benefit declared if:
 - Benefit in hand
 - Following criteria met
 - Budgets and/or EAC's changed to reflect new process
 - Benefit will be achieved with very high degree (>90%) of probability within 6 months
 - Near term, well defined process improvement implemented
- No Benefit declared if:
 - Event or implementation is greater than 6 months
 - Change is only to future actions
 - New contracts/new customers
 - New processes
 - New products

- Company and business unit finance teams developed key metrics to measure the progress and effectiveness of the Six Sigma program
 - Company OP forecast for 2002 required an estimate of System's Six Sigma costs, benefits, and profit impact
- Projects' estimated and actual savings will be captured
- Rollup - # of projects, heads trained, costs, financial benefits, etc
- Metrics will be used for Black Belt, Division, business unit (Systems), and company measurement
 - OIP Goal for each organization will include Six Sigma measures

Measurement Plan

- Money belts will be required to approve savings
- BSC only wants data on completed projects
- Systems will collect data throughout project lifecycle:
 - Potential benefit
 - During DMAIEC/DFSS
 - Following completion
- Post-completion audit options:
 - Review each project 6 months after completion
 - Perform audits on a sample of completed projects
 - Access impact of Six Sigma on system level financials over time
 - others

Company Reporting

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(\$ 000)	Current Year Benefit											
	Hard Benefits									Soft Benefits		
	Income Statement					Asset Reduction		Net Cash Flow Impact				
	Sales	Labor	Material	Overhead	Net P&L Impact		Working Cap.		Other			
					Before Tax	After Tax				(Add'l. Sales/ Cost Avoid.)	Avoided Investment	
										Capex	Other	
Project Benefit												
Program Costs												
Gov't. Reimbursable Cost Impact (if applicable)												
Net Benefit												

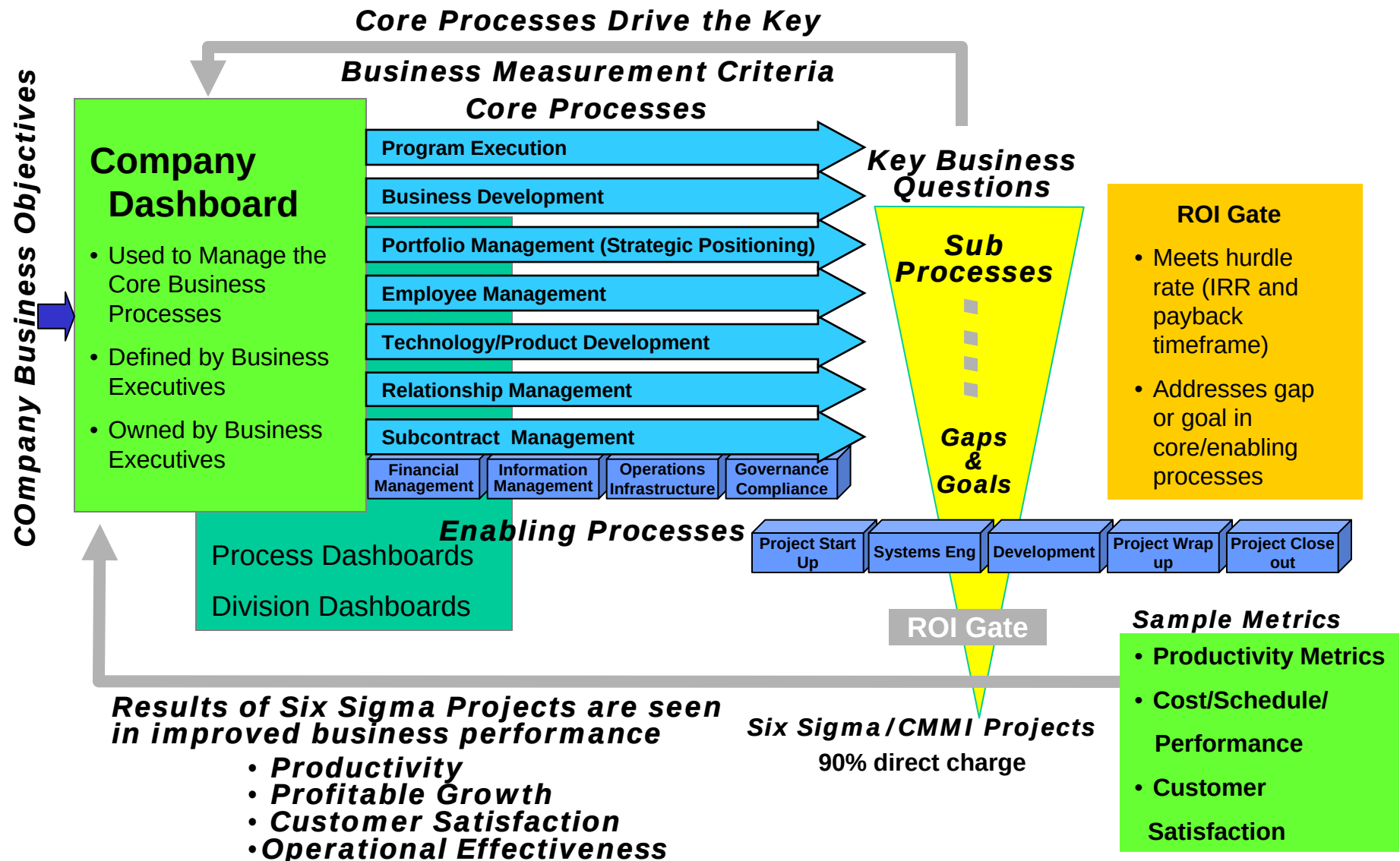
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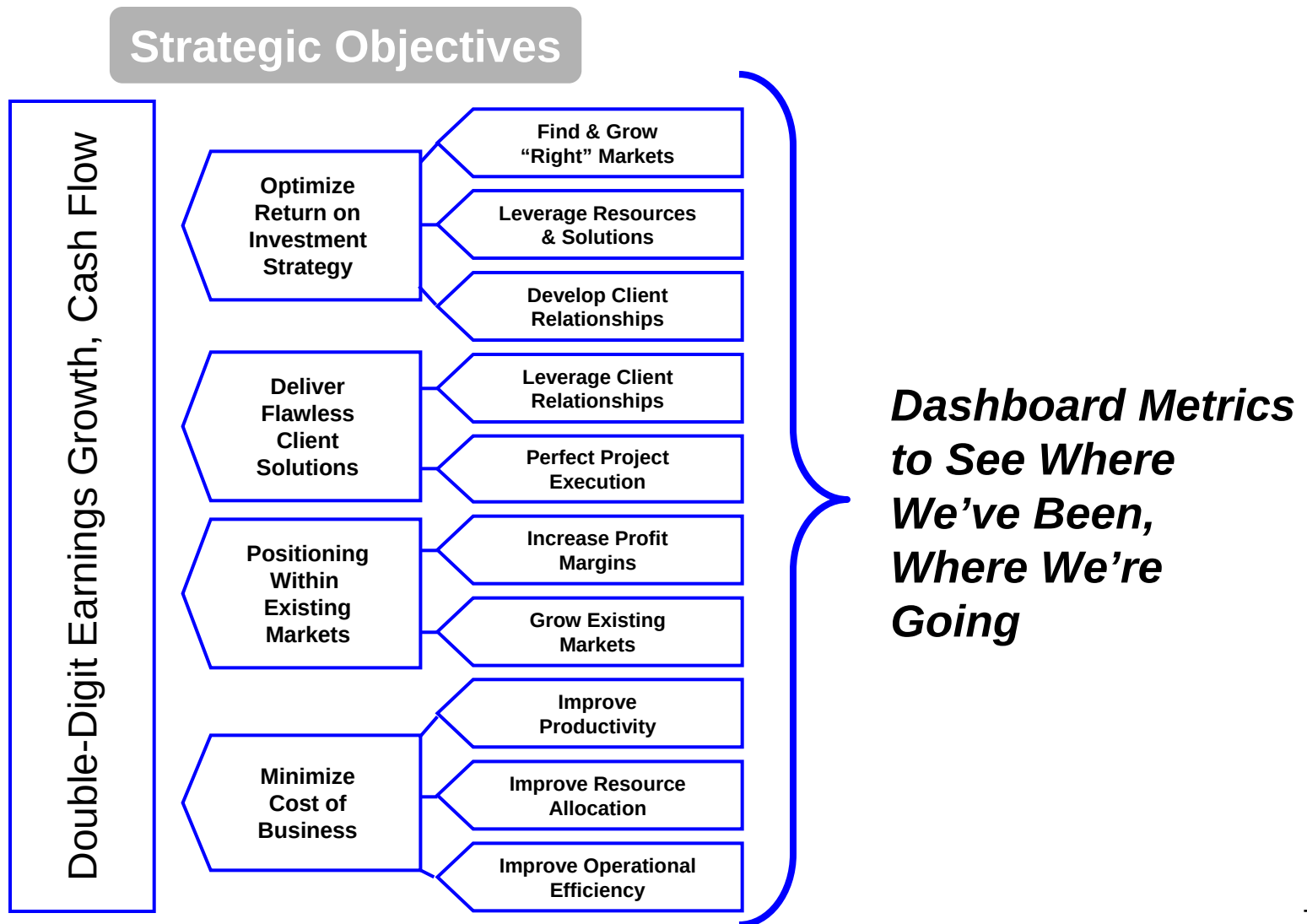
(\$ 000)	Next Year Benefit											
	Hard Benefits									Soft Benefits		
	Income Statement						Asset Reduction		Net Cash Flow Impact			
	Sales	Labor	Material	Overhead	Net P&L Impact		Working Cap.	Other				
					Before Tax	After Tax				(Add'l. Sales/ Cost Avoid.)	Avoided Investment	
										Capex	Other	
Project Benefit												
Program Costs												
Gov't. Reimbursable Cost Impact (if applicable)												
Net Benefit												

Six Sigma - Strategic & Customer View

Six Sigma Drives Company's Strategy

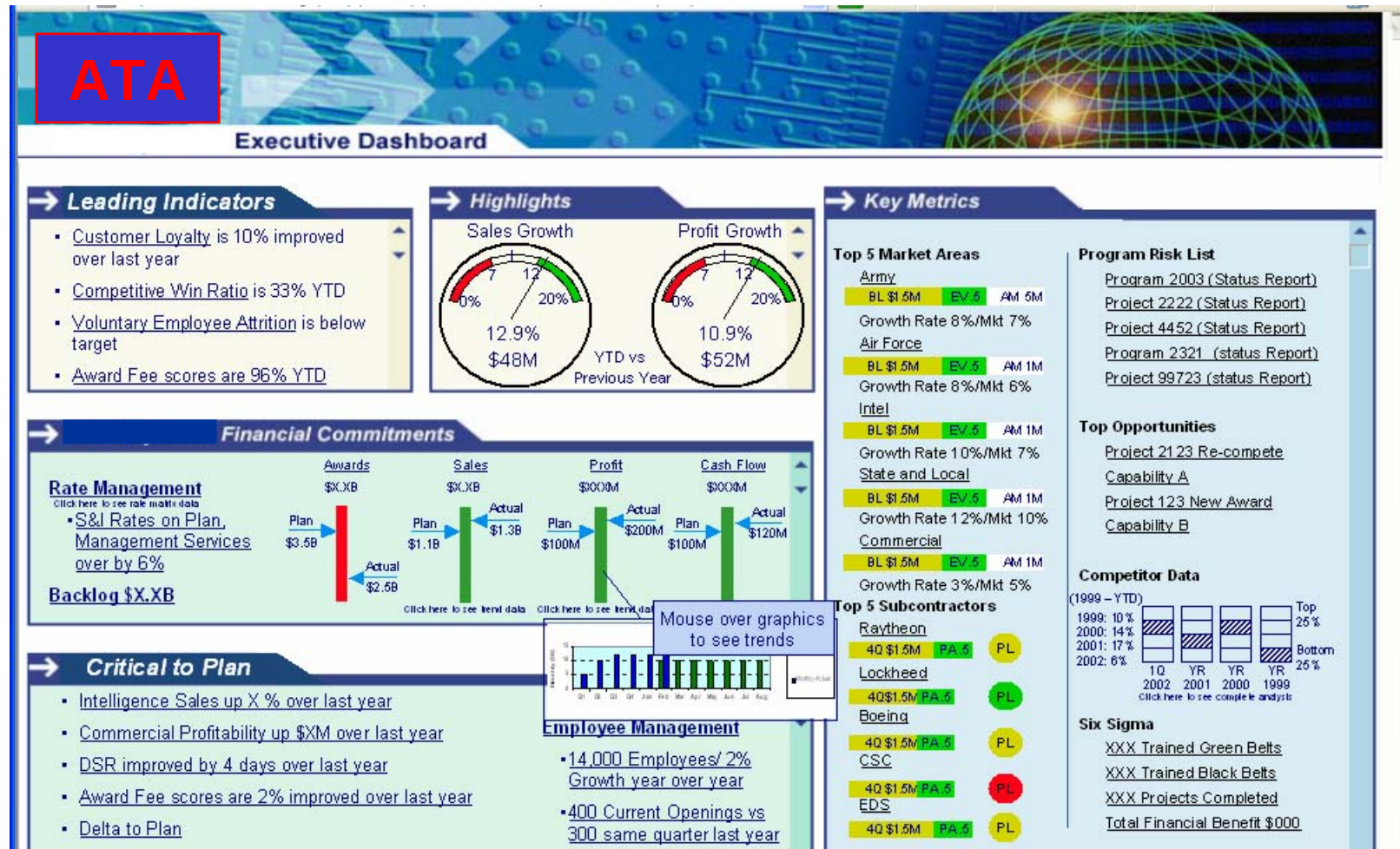
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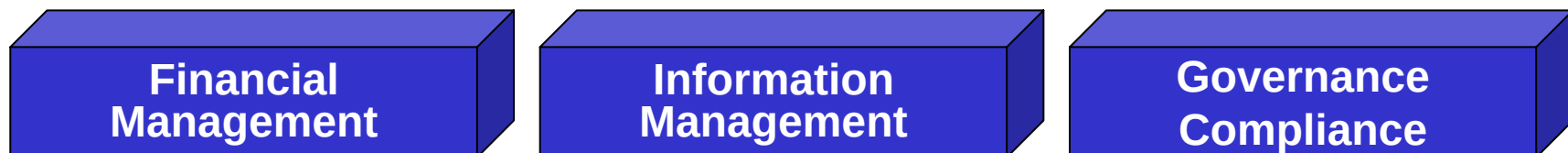
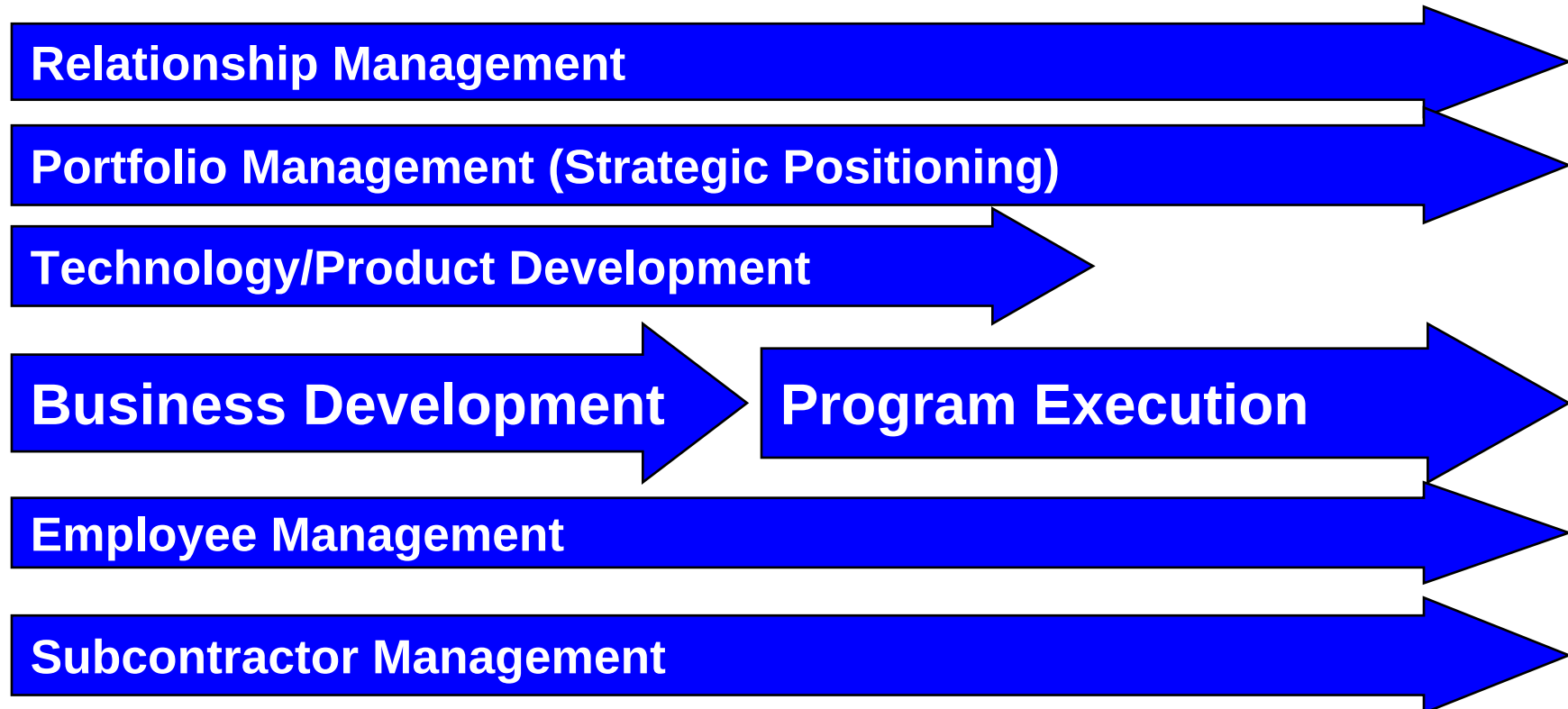


CEO's Dashboard

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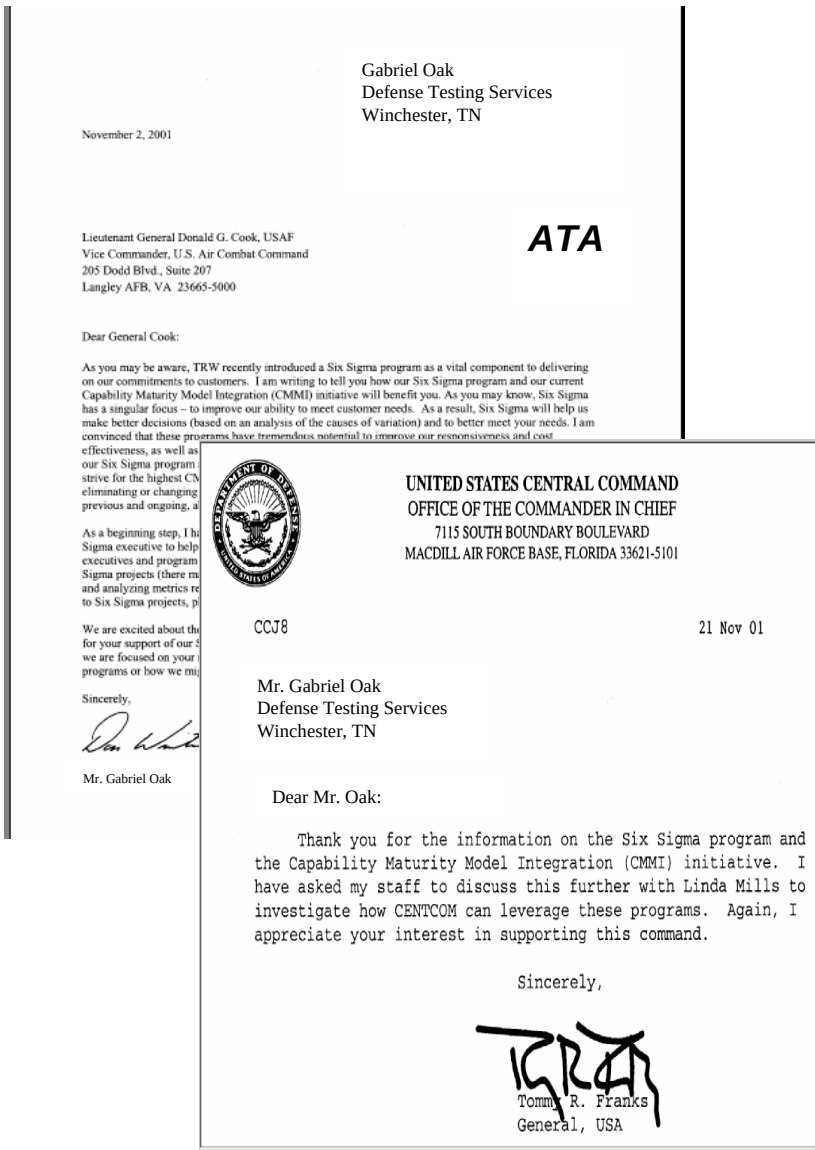
Core Processes



Enabling Processes

Engaging Our Customers

MSCC Six Sigma "Belt"



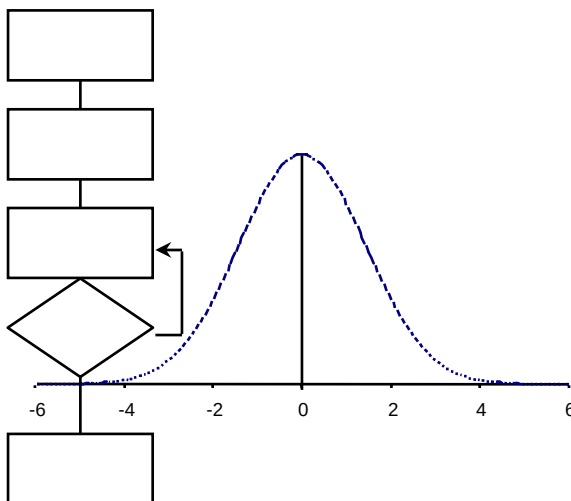
- CEO Letter Sent to All Key Customers
- Significant Number of Senior Customers Expressed

Interest in Hearing More
Ideas for Projects
Participating with Us
Training

Summary & Homework Assignment

- Strategic Decomposition for Divisions and Core/Enabling processes
- *CEO Homework* – Show me how the Six Sigma projects close strategic gaps, priority of the projects, resources dedicated to priority projects, how do we address the “seams”
- *Your Homework* - Meet with your Champion to understand strategy for your Core/Enabling process or Division, as Black Belts, your *first priority* for project selection should be strategic “gap closers”
- See *Tactical Systems Strategic Plan - Attached*

Six Sigma Linked to Business Strategy First Year Approach



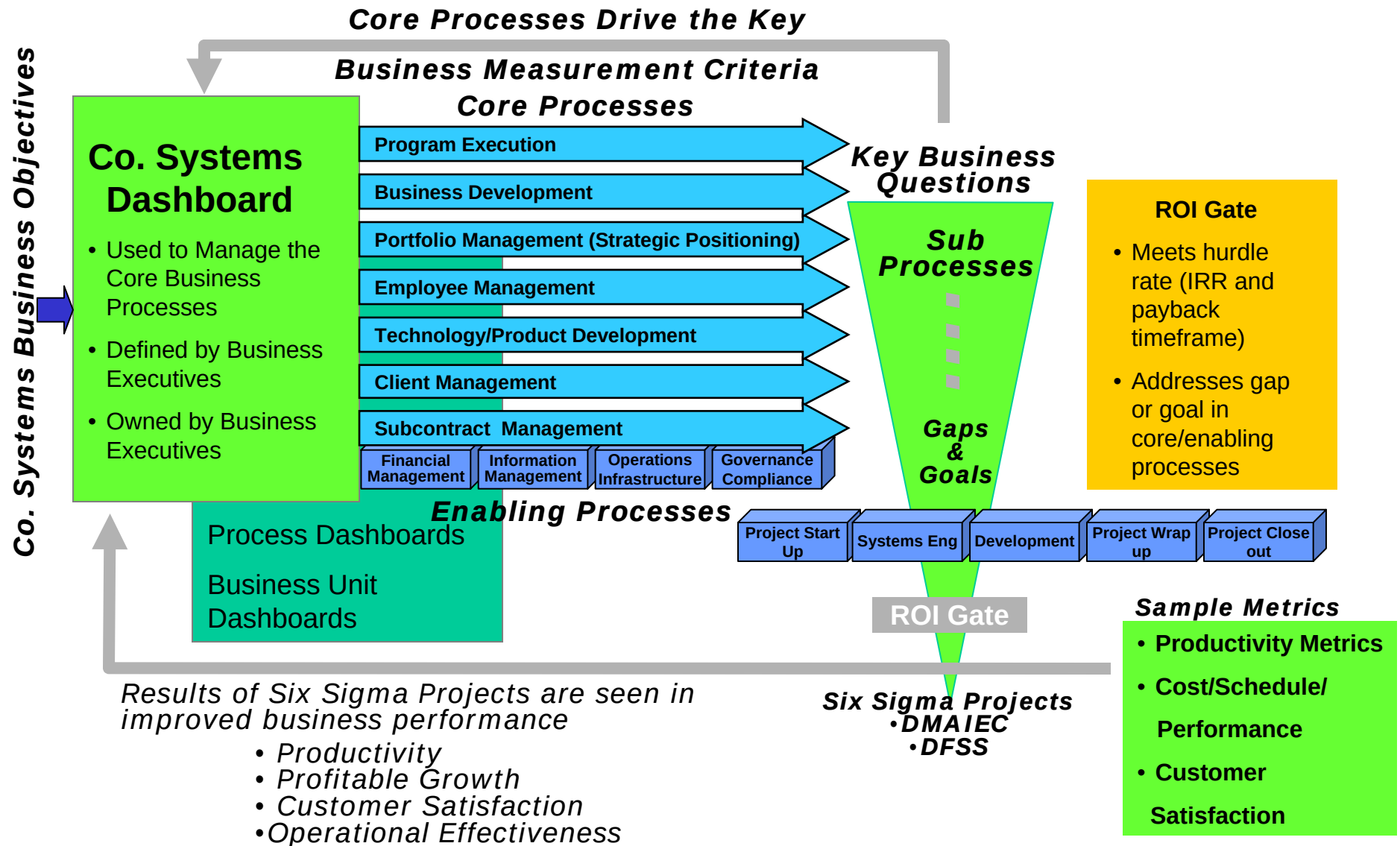
Business Unit:

Strategy, Gap Analysis

Six Sigma Project Portfolio

SAMPLE: Business Units' Six Sigma Strategic Plan

Strategy to Projects - Schematic



Each Business Unit – "Scheduled Event" with CEO

Strategic Gap Analysis – How can & will you contribute to achieving the Co. Systems' strategy through Six Sigma in 200X (Double Digit Earnings Growth & Cash Flow Growth)?

What **objectives** do you/will you need to address,

What **"gaps"** exist between current and desired performance,

What Six Sigma **projects** are needed to address the gaps (within & across business units, '03 "inventory" and '04 plan),

What **benefit** (quantified) will these projects achieve (moving strategic "needles", financial benefit, customer benefit),

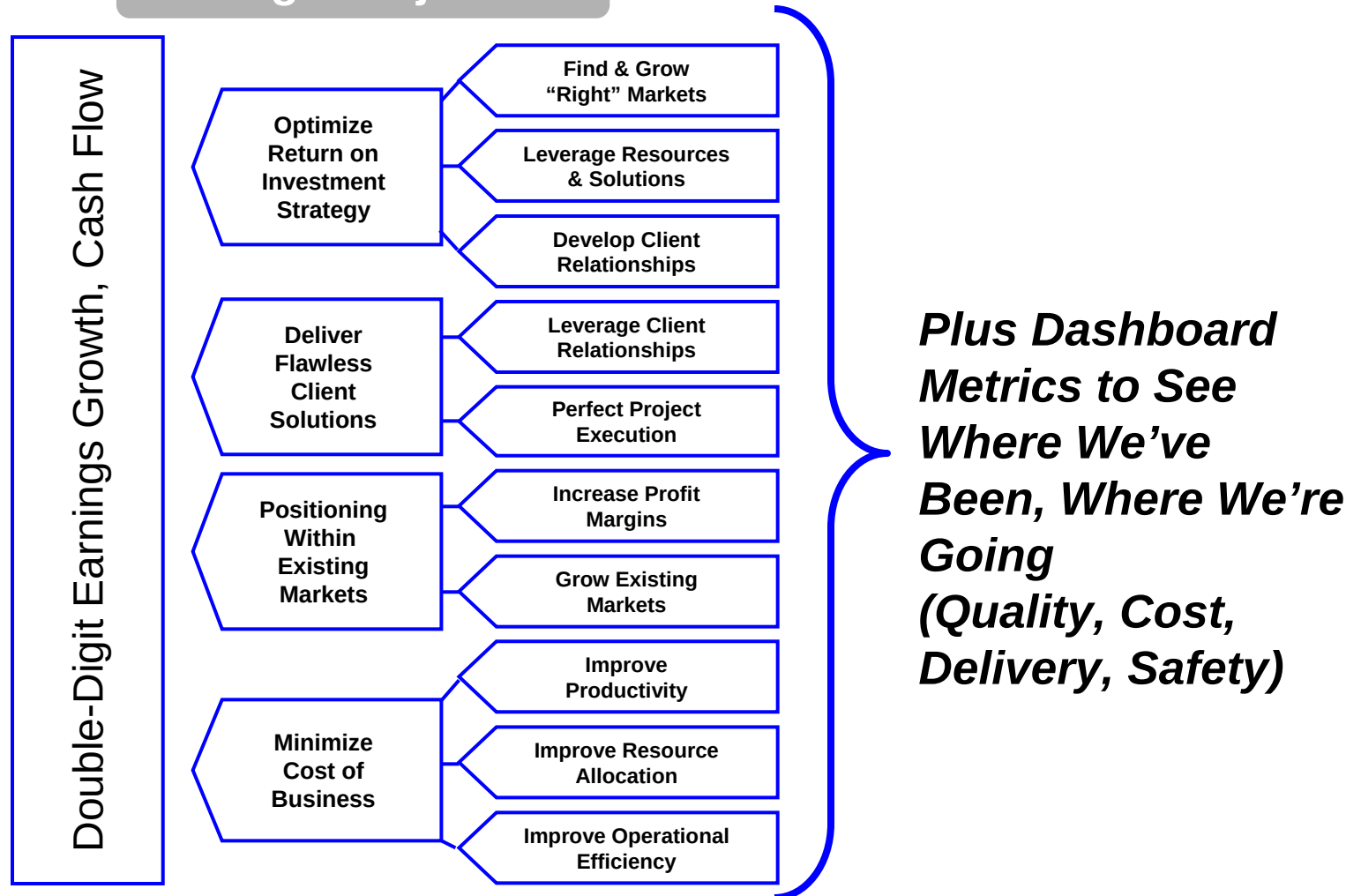
Who is **responsible** for moving the projects to completion?

Summary Strategic Six Sigma (4S) Report

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Six Sigma "Belt"

Strategic Objective	BU "Gap"	Six Sigma Projects	Project Benefit	Project Sponsor
Leverage Client Relationships – National Bank Program	Current cost of National Bank Services too high (customer input)	Reduce cost to provide National Bank mobile phone services	Projected: \$500/unit – 1,000 units to be provided in '04	Fred Henry
		Reduce cost to test/install/ maintain National Bank servers	Projected: \$6000/unit – 1000 units to be installed in '04	

Strategic Objectives



BU's Support of Co. Systems Strategy (looking up)

- Identify mission, scope/boundaries, “products & services” of business unit
- Identify link to overall strategy & associated metrics; performance gaps (“looking up”)

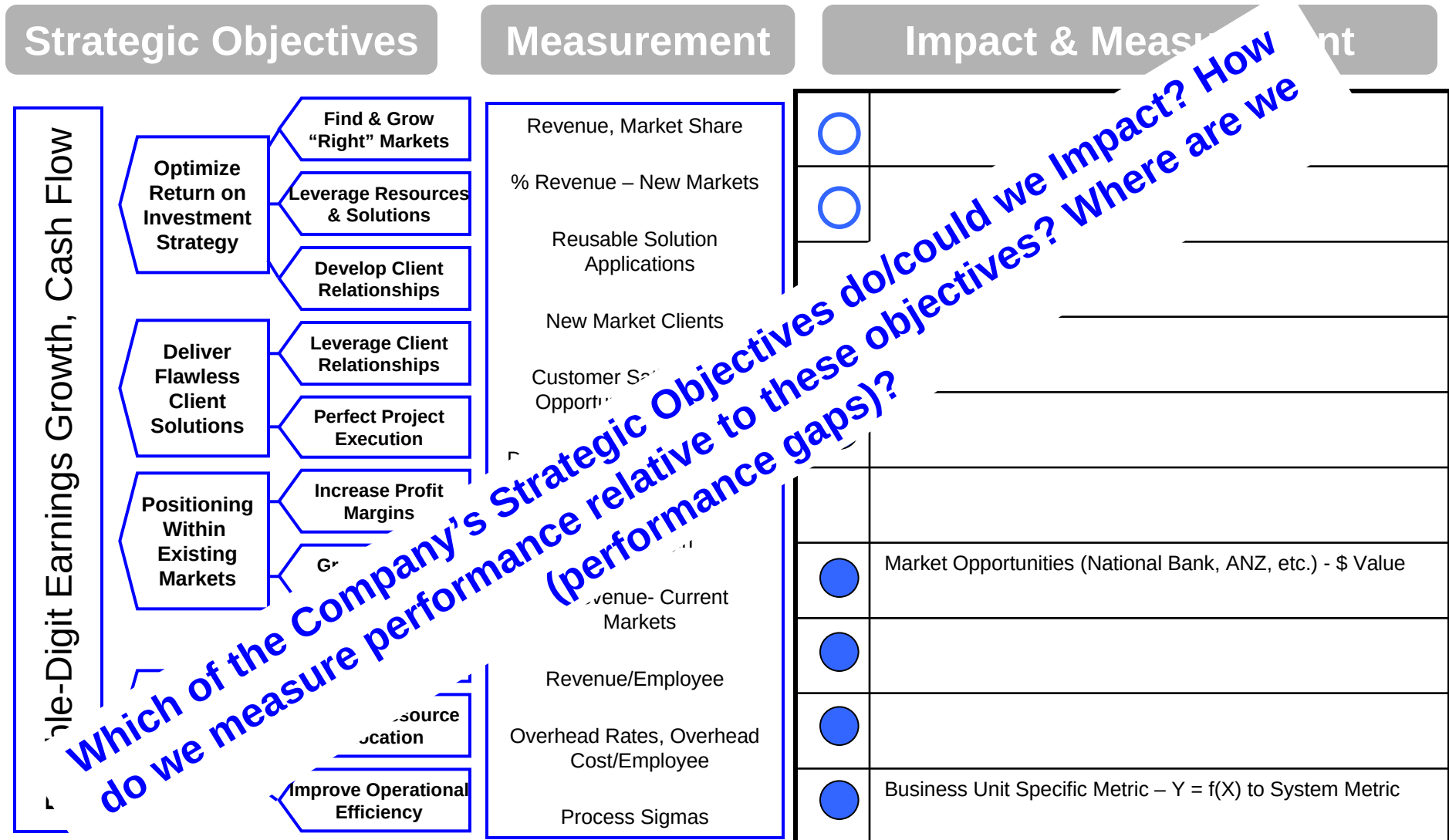
Gaps include performance relative to today's targets that we want to close, or performance relative to tomorrow's goals that we want to achieve

Business Unit Mission & Programs

- Mission: Support Government departments in defining, developing, fielding & operating network and telephone services
- Core Business:
 - Design, install and maintain computer networks for government departments
 - Provide land-line and mobile telephone services
- Government Departments (key customers)
 - Treasury
 - Health & Human Services
 - Homeland Defense
 - Interior

**Discussion: Who We Are, Who Our Customers Are,
What "Products & Services" Do We Provide?**

Our Divisions – Link to Strategy



Strategic Gap Analysis (looking "down & out")

Drill-down to processes & programs impacting performance – identify specific process & program weaknesses – fill with prioritized list of Six Sigma projects ("looking down")

First, BU Level Performance Gaps

Second, BU Process Level Gaps

Third, Disposition Current Six Sigma Projects (Continue, Modify, Drop)

A Utility Example

Company Business Case: Failure rate of fossil-fueled power plants ~ 15% - if not improved, will force company to build an additional 1600 MW of generation – at \$500/installed kW = \$800,000,000 investment in next five years to match load growth. Reduction of failure rate to 3% will **delay** need for investment 5 – 7 years.

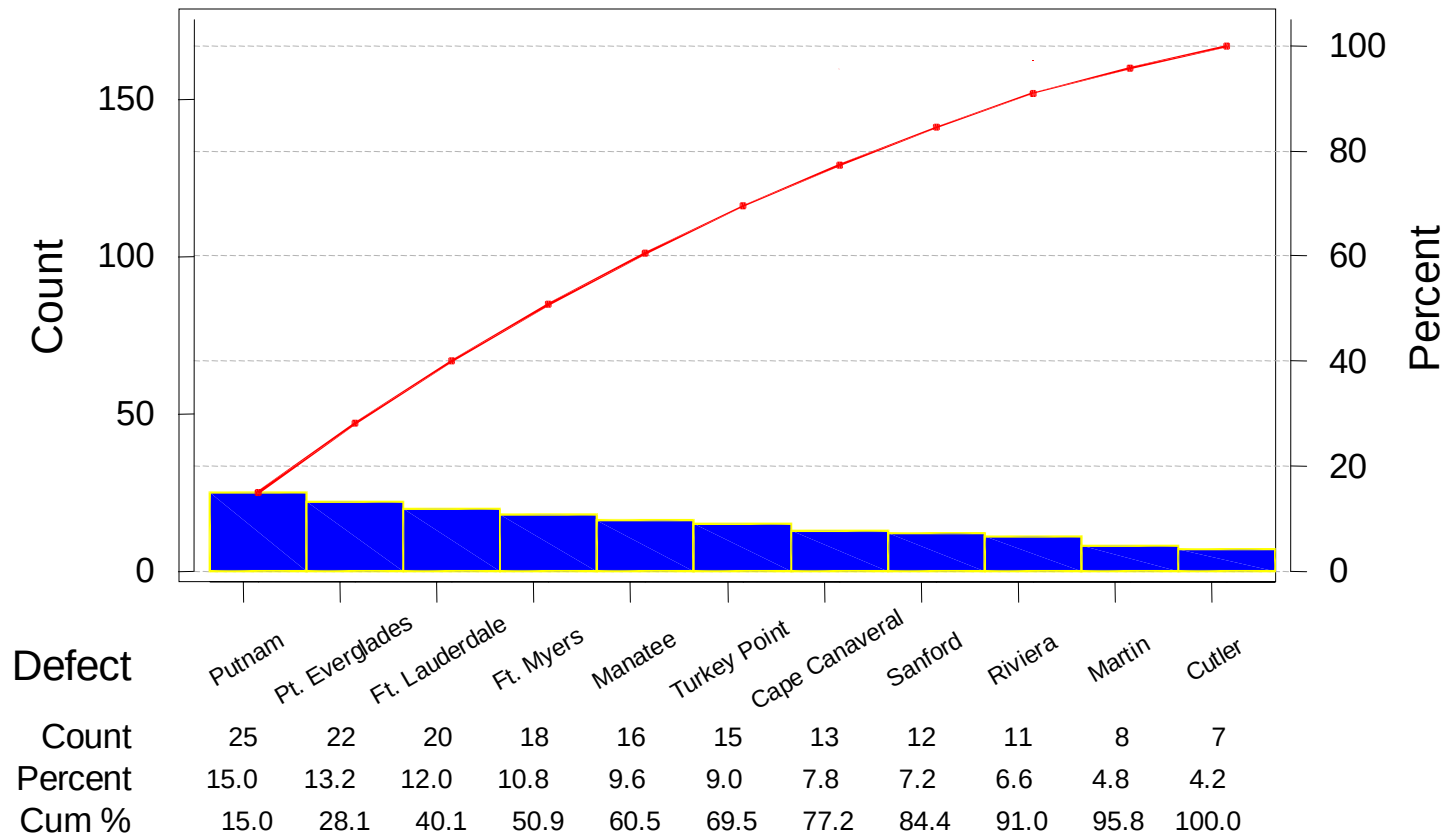
Fossil Department Strategy: Reduce Equivalent Forced Outage Rate (EFOR) from 15% to 2% in next 3 years.



Fossil Failure Rate – Gap Analysis

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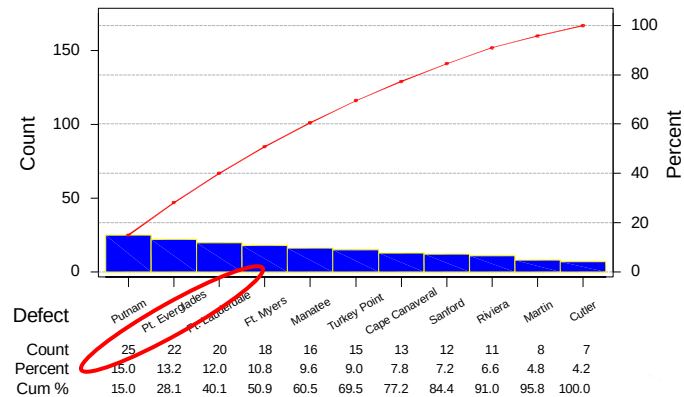
EFOR by Plant (1985)



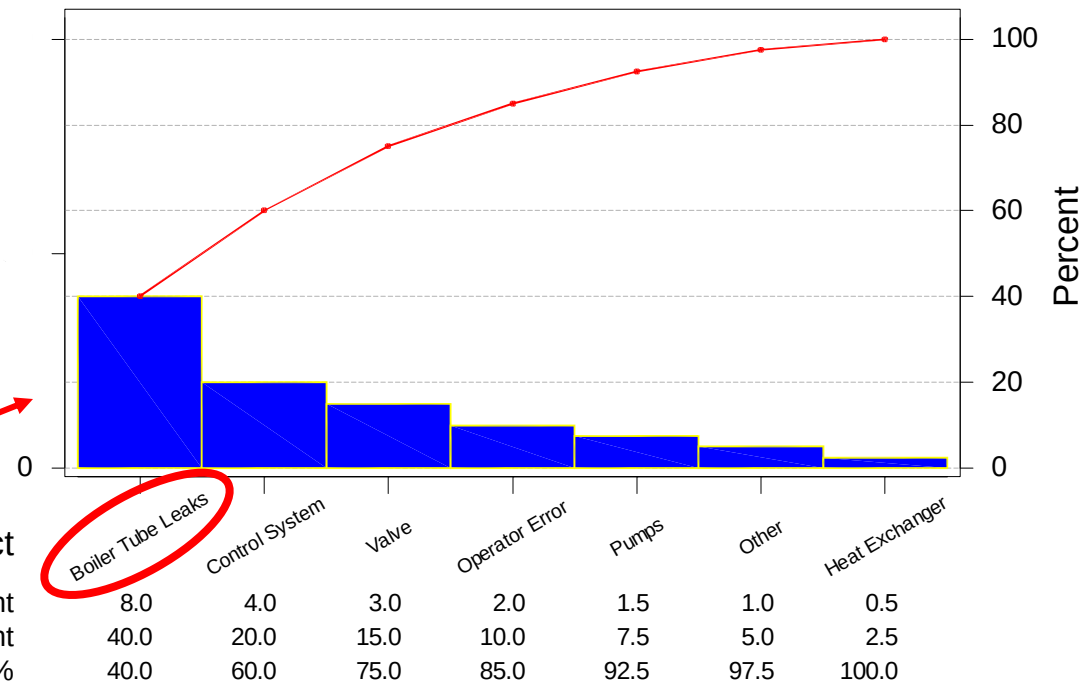
All Plants Contributing to EFOR – Deploy Strategy to Each!

One Plant's Gap Analysis

EFOR by Plant (1985)



EFOR by Failure Mode - Pt. Everglades

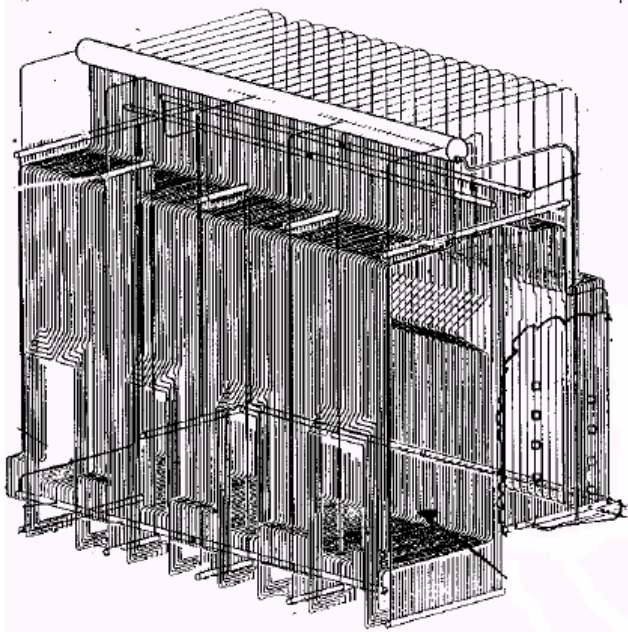


Boiler Tube Leaks

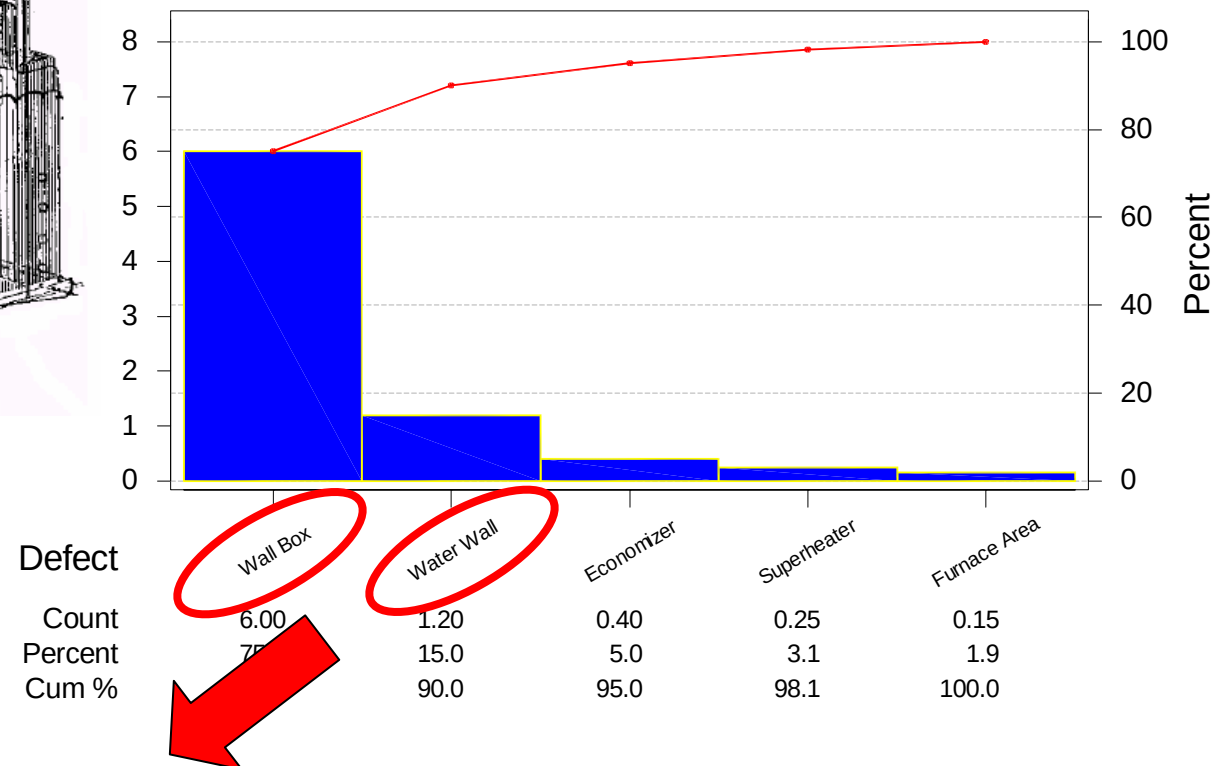
First Stratification leads to Major Plant Failure Areas; too broad for specific BB projects; but opportunity for **"Master" Improvement/DMAIEC**

Master DMAIEC – Boiler Tube Leaks

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EFOR by Boiler Tube Leak Type - Pt. Everglades



Two BB projects chartered: 1) Reduce EFOR due to Wall Box tube leaks, 2) Reduce EFOR due to Water Wall tube leaks

Rollup, Review, Results

- **Rollup** – projected reduction in EFOR (across all projects) “summed” to ensure annual target will be met
- **Review** – BB projects reviewed during analysis (ensuring progress), implementation (making sure what needs improving gets improved)
- **Results** – Benefits of EFOR projects tracked to ensure actual results match forecast (gap analysis here may identify need for additional BB EFOR projects)

Overall Business Unit Metrics & Gap Analysis

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Strategic Objective	Business Unit Metric	Target/Goal	Current Performance	Pro:
Grow Existing Markets	Penetration into Adjacent Markets - \$ Value of Contracts	\$300M by 2003	\$0	

What Targets/Goals (Stretch) Should we set, what is our current performance, future trends – where are the gaps?

Lost Customer/Bid, Low Award Fee Analysis

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- This may be useful to understand where the business unit has “opportunities” – e.g. GE analyzed the causes of **lost** customers and improved business processes through their Six Sigma initiative.

Strategic Gap Analysis

Gap	Actions to Close Gap (Six Sigma Projects, Other)	\$ Value/Prior
Growth into Adjacent Markets	•Develop and implement Bus. Dev. plan to grow into markets (BD) •Assess and develop technology required to grow into markets (TD) •Assess and develop/acquire staff skills necessary to grow (EM)	

What Six Sigma Projects or Other Actions are needed to close the business unit-level gaps?

Business Unit's Process Gaps

BU's Processes

- Link to Company Strategy

Company Business Objectives

Relationship:

Strong - ●

Moderate - ○

DIVISION IMPACT

Portfolio Management (Strategic)

Business Development

Technology/Prod. Development

Client Management

Program Execution

Employee Management

Contractor Management

Information Management

Operations Management

Infrastructure Governance/Compliance

Which of Our Core/Enabling Processes Impact Strategies?

Double-Digit Earnings Growth, Cash Flow

Improve Return on Investment Strategy

Find & Grow "Right" Markets

Leverage Resources & Solutions

Develop Client Relationships

Deliver Flawless Client Solutions

Manage Client Relationships

Perform

Positioning With

Increase Profit Margins

Grow Existing Markets

Minimize Costs of Business

Improve Productivity

Improve Resource Allocation

Improve Operational Efficiency

Business Unit Process Metrics & Gap Analysis

Strategic Objective	Process Metric	Target/Goal	Current Performance	Projected Trend	
Grow Existing Markets	Penetration into Adjacent Markets - \$ Value of Contracts	\$300M by 2003	\$0	\$0	

How Well Are Our Processes Performing, relative to the strategy, where are the gaps?

Strategic Gap Analysis

Gap	Actions to Close Gap (Six Sigma Projects, Other)	\$ Value/Pri v
Growth into Adjacent Markets	•Develop and implement Bus. Dev. plan to grow into markets (BD) •Assess and develop technology required to grow into markets (TD) •Assess and develop/acquire staff skills necessary to grow (EM)	

What Six Sigma Projects or Other Actions are needed to close the process-level gaps?

Customer's "Voice:

- Problems
- Opportunities
- Response to Six Sigma Letter
- Upcoming Bids/Rebids
- Competition Performance

Business Unit "Response"

- ▶ Roles (AIEC)
- ▶ Products/Services (DFSS)

What Are Our Customers Telling Us; What Six Sigma Project Opportunities Result?

Six Sigma Governance Model

How is the business unit planning to govern the Six Sigma initiative and weave it into the fabric of the business?

Elements include:

- Planning (e.g. the analysis supporting this brief)
- Deployment (ongoing identification of Six Sigma opportunities, training to support)
- Execution (project assignment, project execution)
- Review & Results (how business unit will review progress; track results toward business unit-specific strategies, DDEG and Cash Flow Growth)
- Learn (how the business unit will adapt Six Sigma to its specific business challenges)

“Our Business Unit Best Practices”

- Discuss what good things the business unit is doing to accelerate Six Sigma (e.g. executive steering committee, program Six Sigma reviews, etc.)

"Our Division Best Practices"

- Emphasize "bottoms up" approach to Six Sigma
 - Projects/functional areas perform actual tasks using Six Sigma
 - Engage & energize employees to identify problems and understand linkage to Six Sigma implementation
 - Benefits are easily identifiable cost savings (low hanging fruit), grass roots adoption and expansion of the Six Sigma way, which leads to true opportunity for culture change
 - Involve customers when possible
 - Maximize direct charge funding
- Recompose Big Gaps into Workable Projects: 1) solve immediate problems first, 2) use lessons learned to develop organizational approach, and then 3) re-evaluate overall business model
- Goaled Business Areas/Functional Organizations with specific hard savings and BB/GB training numbers
- TSD Web site to communicate detailed Six Sigma information
- Monthly Division Review of Six Sigma status & manager goals

Employees are Changing

"This is great. We are now being given a 'license' to actually pursue improvements in areas where before suggestions were often put off due to resources, timing, etc."

People taking the initiative to come to the BBs and ask " ***Please consider me when you are putting together a project as I would really like to work this.*** "

We are starting to hear a lot of: " ***We should make that a Six Sigma Project*** ."

Now when people talk to BBs about a project they say " ***Oops! Forget that part about the solution!***" or "***Now I know I can't already have decided on a solution but ...***".