MEASUREMENT DRIVEN PROCESS IMPROVEMENT PROGRAM

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This presentation will provide a step-by-step description of the design and implementation of a process improvement program established by the Multimission Ground Systems Office (MGSO) at the Jet Propulsion Laboratory. The program training approach and content are described. Also addressed are the results of the program.

The three main components of the MGSO process improvement program are:

1. A written management policy that officially established the program.
2. A more visible role by the MGSO Manager in support of process improvement and measurement.
3. Hands-on training for MGSO teams.

Below is a summary of the steps that were taken to establish and implement this program:

- The MGSO Manager chartered the Measurement Steering Committee to provide the needed framework for process improvement and measurement.
- The Committee surveyed the MGSO community to establish a baseline of the situation. Results showed that the majority of the community were not using process improvement or measurement and that the main reasons were lack of both training and managers' support.
- The Policy was written and widely distributed to MGSO personnel.
- The Committee researched how to approach training. It was decided that:
    - Training would be developed and taught in-house by MGSO personnel
    - Training would be team oriented
    - Teams would bring a real process to the course to actually improve
    - Training would be just-in-time: teach a little/do a little
- The training was structured into six training classes. Between each class, trainee teams would apply concepts taught in class to their process. *Details of the course content will be provided in the presentation.*
- One volunteer team was selected for the pilot and they were trained.
- Training has been expanded to other teams and individuals.

The pilot was very successful. Upon completion of the training, the team had reduced their cycle time from 25 days to less that two days and they are saving about $15,000 per process cycle. The pilot team spawned two new process improvement teams outside of our training activity. We are now training additional MGSO teams as well as teams from other organizations. The training content and format is continually being improved based on lessons learned. Slowly, employee attitudes about process improvement and measurement are changing.

The major obstacles that we have dealt with along the way include:

- Management's inexperience with getting a program like this off the ground
- Lack of in-house training expertise
- Resistance from personnel and managers
- Difficulty getting trainees to stay motivated
- Limited personnel dedicated to this task
- An overall morale problem due to downsizing and outsourcing

We have learned many lessons along the way. Some of the more important ones are:

- Management support and involvement are absolutely essential to the success of this kind of program.
- A process improvement program is most effective when linked to the real goals and objectives of the organization.
- Resistance to change and inertia are very powerful forces that can cripple new programs.
- Process improvement and measurement are not intuitive activities that just happen. Time, resources and training must be committed.
- When starting a new program, involve forward thinkers who are motivated. Avoid resistors if possible.
- Adequate resources including dedicated personnel should be allocated to keep a program like this moving.

We are building on the work that we have accomplished. We are continuing to train additional teams and to advertise our successes. We see a definite need to get management more involved in this activity. Bottom up change is slow, difficult and probably not possible. We are also hoping to work with management to align our processes with the organization's goals and objectives so that our process improvement activities can be properly prioritized.

Measurement Driven Process Improvement Program

at the Jet Propulsion Laboratory

Marilyn Oifer

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Purpose of Presentation

- To share:
  - Why and how we established our process improvement program
  - Results of our efforts
  - Lessons Learned
  - Future plans

Background

- Jet Propulsion Laboratory (JPL):
  - Federally funded research and development center run for NASA by CalTech (6000 employees)
- JPL Multimission Ground Systems Office (MGSO):
  - A program office that funds software development and operational services for flight projects (350 employees)

Format of Presentation

- Business Needs
- Business Solutions
- Business Results

Business Needs

- Concept Put Into Practice
  - To expand process improvement and measurement throughout MGSO
- Organizational Need
  - Program started in response to1994 annual goal established by the MGSO Manager

Business Needs

- Organizational Need (continued)
  - MGSO Annual Goal:
    - "Implement an effective <u>metrics</u> program within all MGSO organizational elements."

Business Solutions

- How Idea was Implemented
  - MGSO process improvement program:
    - Written management policy that officially established the program
    - More visible role by MGSO Manager in support of process improvement and measurement
      - Encourage his managers to participate
      - Participate in planning and training
      - Advertise successes to community
    - Hands-on training--started with a pilot

Business Solutions

- Specific Steps Taken
  - May 1994: MGSO Manager established the Measurement Steering Committee to:
    - provide framework, processes, knowledge and skills required to improve MGSO processes through the application of measurement techniques
  - Committee surveyed the MGSO community

Business Solutions

- Specific Steps Taken (continued)
  - Results of survey showed:
    - Majority of MGSO community were NOT using process improvement and measurement
    - Attributed to lack of training and managers' support
- MGSO Policy was written and widely distributed
- Steering Committee researched how to approach training

Business Solutions

- Specific Steps Taken (continued)
  - Research
    - Researched and outlined course content
    - Contacted consultants and obtained proposals (content, approach, cost)
    - Talked with JPL internal Professional Development

Business Solutions

- Specific Steps Taken (continued)
  - Decisions made about training
    - Develop and teach in-house by MGSO personnel with JPL Professional Development
    - Emphasis on process improvement with measurement as a supporting tool
    - Team oriented
    - Teams bring real process to actually improve
    - Train just-in-time: "teach a little/do a little"
    - Keep it simple

Business Solutions

- Specific Steps Taken (continued)
  - Two members of the Steering Committee and a Professional Development instructor designed the course
    - Defined the "Process Management Process" and used as basis of course
    - Structured training into 6 classes
    - Working meetings in between each class would be used by teams to apply concepts taught to their process

Business Solutions

- Specific Steps Taken (continued)
  - One team was selected for training pilot program
    - Each manager was requested to recommend one of their teams
    - Process Selection Guidelines
      - Fits definition of a process--needs improvement
      - Small enough to be appropriate for first project, yet not insignificant
      - Manager is sufficiently interested

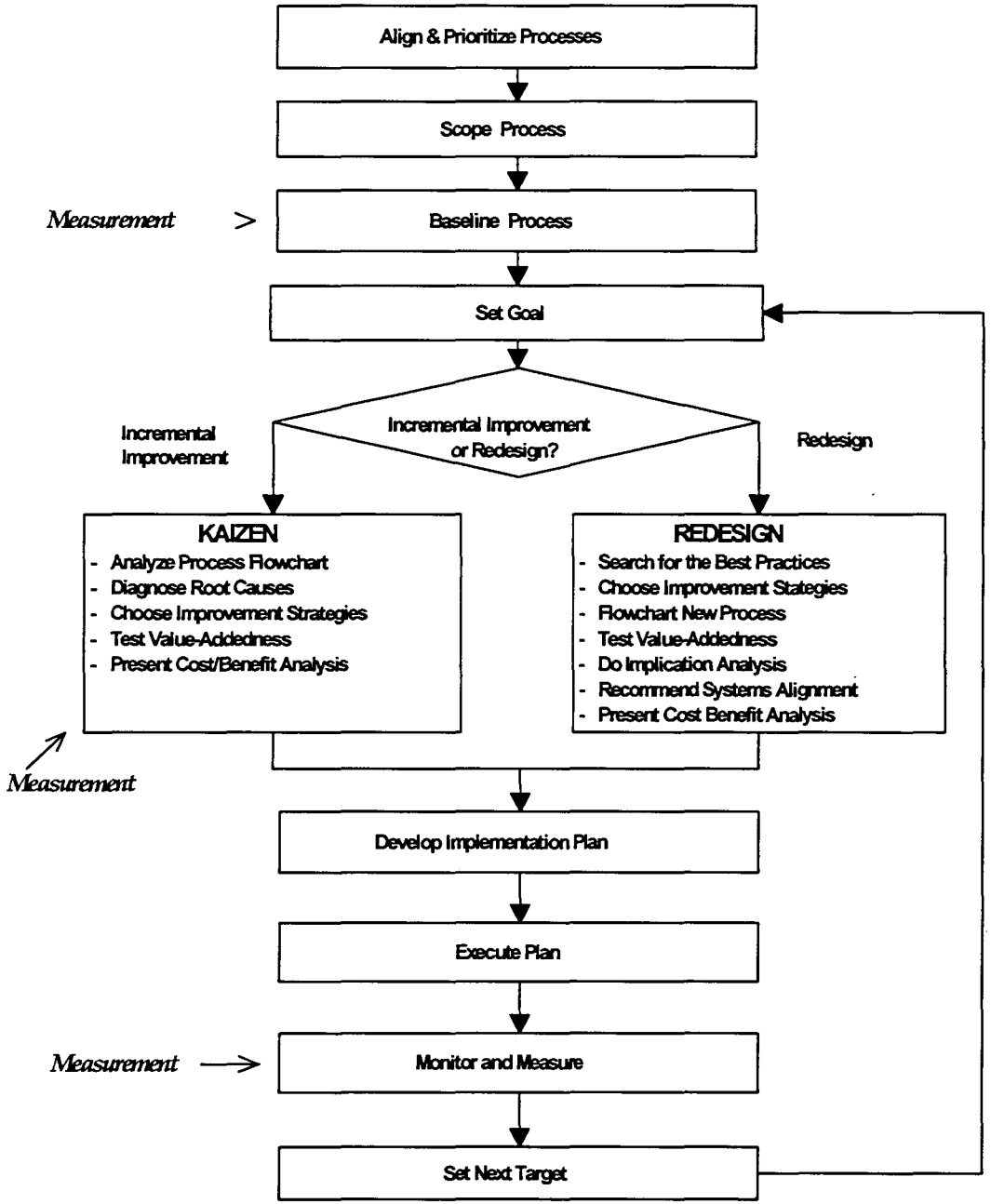
Business Solutions

- Specific Steps Taken (continued)
  - Team Leader Selection Guidelines
    - Has leadership skills or potential
    - Has interest in taking on responsibility and learning leadership skills
    - Not necessarily Supervisor or Group Leader
  - Team Selection Guidelines
    - People who do work, know details, and have direct stake in improvement
    - Not suppliers and customers (participate as needed)
    - If a lot of people ask for volunteers

Business Solutions

- Specific Steps Taken (cont)
  - Team Selection Guidelines (cont)
    - Can commit 2-3 hours a week
    - Not highly resistant
    - Team must have authority to change process
  - The pilot team was trained with very positive results
  - Training has been expanded to additional teams and a class for individuals

PROCESS MANAGEMENT PROCESS



Business Solutions

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Business Solutions

- Obstacles & How We Overcame Them
  - Management's inexperience with getting this kind of program off the ground
    - Made informative presentations and pitches to managers
    - Kept MGSO Manager informed and got agreement every step of way
    - Involved Manager in planning and training

Business Solutions

- Obstacles & How We Overcame Them (cont)
  - Lack of training expertise within MGSO
    - Got support from JPL Professional Development
    - Gave Steering Committee members hands-on training design and teaching experience

Business Solutions

- Obstacles & How We Overcame Them
  - Lack of motivation and resistance by personnel and managers
    - Started with pilot team with a very supportive manager
    - Advertised our successes via email, at meetings and in the halls
      - Submitted pilot team for JPL TQM award--they won/published in JPL newspaper
    - This is still a major obstacle

Business Solutions

- Obstacles & How We Overcame Them (cont)
  - Difficulty getting trainees to stay motivated and keep moving
    - Trained team leaders on team dynamics and tools
    - Trainers facilitate the team working meetings
    - We are very persistent in nudging teams along
    - This is still a major obstacle

Business Solutions

- Obstacles & How We Overcame Them (cont)
  - Limited personnel dedicated to this task
    - This is still an obstacle
  - Overall morale problem at JPL due to downsizing and outsourcing
    - We continue to compete with this problem

Business Results

- Results of Our Efforts
  - Pilot team results
    - Reduced cycle time from 25 days to less than 2 days/saved $15k per process cycle
    - Won JPL Silver Medallion TQM award
    - Reversed trainee's skepticism to enthusiasm
  - Trained two additional teams and a class of individuals

Business Results

- Results of Our Efforts (cont)
  - Now beginning to train teams from outside of MGSO
  - Other teams using bits and pieces of our approach
  - Improved training content based on lessons learned

Business Results

- Effects on Organization, Productivity, Customers and Employees
  - MGSO Manager is very supportive of program
  - SLOWLY changing employees' attitudes about process improvement/measurement

Business Results

- Effects on Organization, Productivity, Customers and Employees (cont)
  - Effect beginning to snowball.
    - Pilot team spawned two new process improvement teams outside of our training activity
  - Training curriculum is being adopted at higher JPL level to train process owners

Business Results

- Lessons Learned/Hindsight
  - Management support and <u>involvement</u> is ESSENTIAL to success of this kind of program
  - A process improvement program is most effective when aligned with goals and objectives of the organization
  - Resistance to change and inertia are powerful preventative forces

Business Results

- Lessons Learned/Hindsight (cont)
  - Real change is often evolutionary
  - Process improvement and measurement are not intuitive
    - Time, resources and education are necessary
  - To start, involve individuals that are forward thinking and motivated--avoid resistors

Business Results

- Lessons Learned/Hindsight (cont)
  - Team-oriented training:
    - Advantages:
      - Deal with larger processes (more bang for the buck)
      - Gain benefit of different points of view
      - Enthusiasm can rub off
    - Disadvantages:
      - Weak team leader can sabotage the activity
      - Strong members carry weak members
      - Negativism can rub off

Business Results

- Lessons Learned/Hindsight (cont)
  - Just-in-time training
    - Advantages:
      - Teams finish training with an improved process
      - Comprehension enhanced because techniques taught are actually applied to their process
      - Teamwork skills are developed
    - Disadvantages:
      - Not a cure for resistance, inertia and lack of motivation
      - Can drag on and lose steam

Business Results

- Lessons Learned/Hindsight (cont)
  - Adequate resources including dedicated personnel should be allocated to keep a program like this moving
  - Data obtained by surveying employees and customers is an effective tool for convincing management

Business Results

- How We Will Build on this Effort
  - Continue to expand by training additional teams and individuals
  - Continue to advertise our successes
  - Work towards getting managers more involved
  - Teach management how to align and prioritize processes with the organization's goals and objectives

Conclusion

- Discussion and Questions