

Six Sigma Certificate and Certification Programs

Module 4: Six Sigma Black Belt Certification Program (Certified Black Belt)

Mark Kiemele, Ph.D.

Air Academy Associates



Outline

- Six Sigma Green Belt Training Certificate Module 1
- Six Sigma Black Belt Training Certificate Module 2
- Six Sigma Green Belt Certification Program Module 3
(Certified Green Belt)
- Six Sigma Black Belt Certification Program Module 4
(Certified Black Belt)



Black Belt Certification Requirements*

1. Register for and successfully complete the 14-course Six Sigma Black Belt curriculum, including the online tests for Courses 1-14.
2. Successfully complete the final Six Sigma Black Belt Knowledge Assessment:
 - a 70% passing grade is required (can be taken twice)
3. Successfully complete a Six Sigma Black Belt project:
 - the Define, Measure, Analyze, Improve, & Control (DMAIC) methodology must be properly and successfully applied

*Note: Completion of (1) and (2) above will result in a Six Sigma Black Belt Training Certificate



Six Sigma Certificate and
Certification Programs / Module 4

© Air Academy Associates 2004



3

Black Belt

Certification Requirements (cont.)

4. Complete a well-written and properly documented final project report.
 - must meet AAA project criteria
 - must include financial impact statement and validation
5. Complete a final oral briefing of the project to the student's organizational leadership.
 - must be validated by signatures of project briefing recipients



Six Sigma Certificate and
Certification Programs / Module 4

© Air Academy Associates 2004



4

Curriculum Program Required for Six Sigma Black Belt Certificate/Certification

Courses	Course Titles
Course 1	The Basics of Six Sigma
Course 2	The Soft Side of Insuring Six Sigma Success
Course 3	Making Sense Out of Data Using Graphical and Numerical Tools (Descriptive Statistics)
Course 4	Measurement System Analysis
Course 5	Analyzing the Process and Prioritizing the Focus
Course 6	Detecting Significant Differences from Sample Data (Inferential Statistics)
Course 7	Process Control and Process Capability



Six Sigma Certificate and
Certification Programs / Module 4

© Air Academy Associates 2004



5

Additional Courses Required for Six Sigma Black Belt Certificate/Certification

Courses	Course Titles
Course 8	Understanding Data Distributions and Their Applications
Course 9	Introduction to Regression Analysis and Design of Experiments (DOE)
Course 10	Design and Analysis with 2-Level Factors
Course 11	Summary of 2-Level Designs with Rules of Thumb
Course 12	Three-Level Designs with Robustness and Multiple Response Optimization
Course 13	Historical Data Analysis
Course 14	Special Topics





Six Sigma Certificate and
Certification Programs / Module 4

© Air Academy Associates 2004



6

<p>Date _____</p> <p>_____ Completed Six Sigma Black Belt courses</p> <p>_____ Passed Black Belt Knowledge Assessment with a grade of 70% or higher.</p> <p>_____ Project Complete. Documentation must follow report guidelines.</p> <p>_____ Oral Briefing Complete. Verified by signatures of Finance Executive and Champion (or Executive VP).</p> <p>Package prepared and sent to AAA:</p> <p>_____ This completed checklist</p> <p>_____ Written project report</p> <p>_____ Copy of training certificate</p> <p>_____ Corporate certification of savings and oral briefing.</p> <p>Note: The above package may be submitted electronically with the exception of the corporate certification of savings and oral briefing which must be submitted in hard copy.</p>	<h2 style="color: red;">Certification Checklist</h2> 
---	--

<p>Company: _____</p> <p>Black Belt Candidate: _____</p> <p>Project Name: _____</p> <p>Project Description: _____</p> <p>Estimated Savings (annualized \$): _____</p> <p>Other Business Benefits: _____</p> <p>This is to certify that the above Black Belt candidate has completed the required project through the control phase with savings and benefits as stated above. A satisfactory oral briefing was completed on _____ (date).</p> <p>Champion (or Executive VP) _____ Finance Executive _____</p> <p>Attendees (with title):</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 	<h2 style="color: red;">Corporate Certification Statement</h2> 
---	--

Project Grading Criteria

- Each project will be evaluated according to the following criteria:
 - Is the project documented with team members, black belt candidate, and champion?
 - Is the problem statement clear?
 - Is a baseline (pre-improvement) metric given?
 - Was the DMAIC methodology used?
 - Was the Project Report Outline followed?

Project Grading Criteria (cont.)

- Are the following tools present:
 - IPO diagram
 - PF/CE/CNX/SOP
 - FMEA
 - MSA
 - Proof of Improvement (at least one from each group):
 - Capability Analysis (Sigma level, yield, FPY, COPQ, dpm, Cp, Cpk).
 - Graphical Analysis (Paretos, Histograms, Run Charts, Control Charts, Box Plots, Scatter Diagrams, etc. as appropriate).
 - Statistical Analysis -- Shifts in Average and Standard Deviation (t-tests, F-tests, Rules of Thumb, Confidence Intervals, Hypothesis Tests, Regression, DOE, etc. as appropriate).
 - Control Plan
- Are the savings documented?

Project Report Outline

- Part 1: COVER PAGE

Include:

- Individual's name, company name, title of project, contact information, time frame of project, and date of submittal

Project Report Outline (cont.)

- Part 2: EXECUTIVE SUMMARY

This is a 1-page summary that gives a broad understanding of the project and can be read as a standalone document

Include:

- Problem statement and business case
- Performance level at start of the project and gap
- Root cause(s) of problem
- Improvement options and what option was selected
- Control Plan put in place
- Conclusions, Recommendations, and Business Results

Project Report Outline (cont.)

- Part 3: DEFINE PHASE

This is a discussion and introduction to the project, the problem(s) addressed, and accomplishments during the “Define” phase of the project.

Include:

- Problem Statement with Goals (Business Case)
- Project Scope
- Key business indicators (measures) that will be affected
- Identification of Process Owner, Champion, Black Belt candidate, team, and any other key stakeholders
- Identification of Customer(s) and customer requirements (CTCs)



Project Report Outline (cont.)

- Part 4: MEASURE

This is a discussion of the current state analysis and target levels of performance, along with accomplishments during the “Measure” phase of the project.

Include:

- Process Flow (PF)
- IPO with performance measures identified
- Process capability analysis
- Refined Problem Statement
- Measurement System Analysis
- Tools used



Project Report Outline (cont.)

- Part 5: ANALYZE

This is a discussion of the analysis related to the performance gaps. Problems and bottlenecks should be identified, along with their root causes, as well as other accomplishments during the “Analyze” phase of the project.

Include:

- Key Input variables (CE/CNX/SOP)
- Verification of root cause(s) with data
- Relationships of inputs to outputs
- Tools used (ex. Scatter diagram, DOE, hypothesis tests, etc)



Project Report Outline (cont.)

- Part 6: IMPROVE

This is a discussion of the alternate solutions that were considered to improve performance, along with other accomplishments during the “Improve” phase of the project.

Include:

- Potential solutions identified and tested
- Solution(s) implemented
- Post-improvement capability
- Cost-benefit analysis
- Tools used (ex. IPO Matrix, hypothesis tests, etc.)



Project Report Outline (cont.)

- Part 7: CONTROL

This is a discussion of the suggested methods for holding the gains from the project, along with other accomplishments during the “Control” phase of the project.

Include:

- Enhanced (updated) process flow and SOPs
- Identification of key performance measures being monitored
- Control plan (ex. FMEA, control charts, accountability, frequency, defect detection capability, etc.)
- Verification of business impact (results)



Project Report Outline (cont.)

- Part 8: SUMMARY

This is a restatement of the problem(s) addressed, key learnings, chosen solution, and project results.

Include:

- Actual project results (or projected results)
- Summary of recommendations and solutions
- Lessons learned
- Future plans or recommendations



Project Report Outline (cont.)

- Part 9: APPENDIX (Optional)
 - Include additional data, charts, figures, tables, etc. not included in other parts of the report

Report Guidelines

- Here are some guidelines and helpful hints when writing your project report:
 - The report should be eight to fifteen single-spaced pages (including your tables and charts).
 - The report must provide clear evidence of the DMAIC process and appropriate use and interpretation of the tools and methodology.

Report Guidelines (cont.)

- Use graphics (ex. Pareto diagrams), tables, and figures in the body of the report wherever possible in support of written discussion. Make sure all graphs and charts are labeled clearly.
- Include any long, bulky data sets you wish to use in the appendix rather than in the body of the report.
- Define any acronyms or abbreviations used.
- Translate the gains of the project into financial results whenever possible.



Six Sigma Black Belt Certification Resource Package

- The following is included in the registration resource package for Black Belt Certification:
 1. Knowledge Based Management (text)
 2. Basic Statistics: Tools for Continuous Improvement (text)
 3. Understanding Industrial Designed Experiments (text)
 4. Lean Six Sigma Tools Guide (handbook)
 5. SPC XL (software)
 6. DOE KISS (software)
 7. DOE PRO (software)
 8. SimWare (software)
 9. Knowledge Notebook (for project documentation)
 10. 3 hours of Consulting/Project Report Review time with AAA

Certification Resource Package items 1-9 will be mailed to the enrollee upon enrollment.

