RELIABILITY PROGRAM ASSESSMENT

A RELIABILITY ASSESSMENT IS A SYSTEMATIC EVALUATION OF A BROAD RANGE OF POTENTIAL RELIABILITY ACTIVITIES AND TOOLS AS CURRENTLY EMPLOYED AND INTEGRATED

As part of the process, we shall have discussions with key personnel from engr, ops, mktg, field svc, purchasing, etc

AS A MINIMUM, A RELIABILITY ASSESSMENT COVERS THE FOLLOWING AREAS:

- Assembly
- Design Criteria
- Engr Practices
- ESD
- Parts Screening
- Company Processes
- RMA Returns
- Test philosophy

Initial Assessment & definition of reliability objectives
(Where You Are – 10,000 foot view)

◊ Review product specifications and requirements. This includes overall division reliability related objectives, specific product objectives and performance.
◊ Conduct interviews (approximately 1 hour each) with 6-8 key individuals on reliability objectives and management processes. The focus is on reliability related areas of design, procurement and manufacturing of products to meet reliability objectives.
◊ Conduct a cursory review of each area highlighted in the Project Objectives.
Deliverables: Brief report and presentation on initial findings and areas of focus for next phase
  ○ Simple Product ~$4-6,000
  ○ Complex Product ~$6-8,000

Detailed reliability practices assessment
(Where You Are – Ground-level view)

◊ Based on results for Initial Assessment plus guidance from customer, identify product teams and product reliability focus areas for in-depth assessment.
◊ Conduct interviews (approximately 1 hour each) with 6-8 key engineering and management personnel. The focus is a thorough assessment of current product reliability practices.
◊ Conduct a more thorough review of each area highlighted in the Project Objectives.
◊ Review detailed field failure information and production yields to understand possible holes in processes.
Deliverables: Brief report and presentation on interview results, observations, and data analysis.
  ○ Simple Product ~$6-8,000
  ○ Complex Product ~$8-10,000

Benchmarking (Where You Need to Be)

Deliverables: Brief report and presentation detailing how to set your goals based on competition, customer requirements, and internal goals
  ○ Single Product Line ~$4-6,000
  ○ Multiple Product Lines ~$6-10,000

Gap Analysis (How Much Improvement is Needed)

Conduct analysis of assessment and benchmarking information, compare to other successful reliability programs (based on our experience in similar programs).

Deliverables: Brief report and presentation detailing strengths and weaknesses of current reliability program including recommendations on next steps and long-term reliability program improvements.
  ○ Simple Product ~$1-2,000
  ○ Complex Product ~$3-4,000

Reliability Program Plan (How You Should Get There)

Develop a plan taking into account goals, requirements, schedules, and resources. The plan shall outline which elements of reliability to include and the expected contribution of each element to the overall reliability.

Deliverable: Reliability Program Plan taking into account goals, requirements, schedules, and resources
  ○ Simple Product ~$2-4,000
  ○ Complex Product ~$4-6,000

OTHER RELATED SERVICES

✔ Estimate product Failure Rate (MTBF) with Reliability Predictions at Component Level and System Level
✔ Maximize product robustness with Accelerated Stress Testing (HALT)
✔ Eliminate infant mortalities with production screening (HASS)
✔ Measure the product’s reliability with Reliability Demonstration Tests (RDT)

TERMS

Expedited (rush) analyses available at nominal fee
Formal quotes: Fixed Price or Time and Materials basis
Invoicing: On progress, Payment: Net 15 days after invoice
# Reliability Maturity Matrix

(Based on Quality Management Maturity Grid, from *Quality Is Free*, ©1979 by Philip B. Crosby)

<table>
<thead>
<tr>
<th>Measurement Category</th>
<th>Stage I: Uncertainty</th>
<th>Stage II: Awakening</th>
<th>Stage III: Enlightenment</th>
<th>Stage IV: Wisdom</th>
<th>Stage V: Certainty</th>
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</thead>
<tbody>
<tr>
<td>Management Understanding and Attitude</td>
<td>No comprehension of reliability as a management tool. Tend to blame reliability engineering for ‘reliability problems’</td>
<td>Recognizing that reliability management may be of value but not willing to provide money or time to make it happen,</td>
<td>Still learning more about reliability management. Becoming supportive and helpful.</td>
<td>Participating; Understand absolutes of reliability management. Recognize their personal role in continuing emphasis.</td>
<td>Consider reliability management an essential part of company system.</td>
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<tr>
<td>Reliability status</td>
<td>Reliability is hidden in manufacturing or engineering departments. Reliability testing probably not part of organization. Emphasis on initial product functionality.</td>
<td>A stronger reliability leader appointed, yet main emphasis is still on an audit of initial product functionality. Reliability testing still not performed.</td>
<td>Reliability manager reports to top management, with role in management of division.</td>
<td>Reliability manager is an officer of company; effective status reporting and preventive action. Involved with consumer affairs.</td>
<td>Reliability manager is on board of directors. Prevention is main concern. Reliability is a thought leader.</td>
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<tr>
<td>Problem handling</td>
<td>Fire fighting; no root cause analysis or resolution; lots of yelling and accusations.</td>
<td>Teams are set up to solve major problems. Long-range solutions are not identified or implemented.</td>
<td>Corrective action process in place. Problems are recognized and solved in orderly way.</td>
<td>Problems are identified early in their development. All functions are open to suggestion and improvement.</td>
<td>Except in the most unusual cases, problems are prevented.</td>
</tr>
<tr>
<td>Cost of Reliability as % of net revenue</td>
<td>Warranty: unknown Reported: unknown Actual: 20%</td>
<td>Warranty: 3% Reported: unknown Actual: 18%</td>
<td>Warranty: 4% Reported: 8% Actual: 12%</td>
<td>Warranty: 3% Reported: 6.5% Actual: 8%</td>
<td>Warranty: 1.5% Reported: 3% Actual: 3%</td>
</tr>
<tr>
<td>Feedback process</td>
<td>None. No reliability testing. No field failure reporting other than customer complaints and returns.</td>
<td>Some understanding of field failures and complaints. Designers and manufacturing do not get meaningful information.</td>
<td>Accelerated testing of critical systems during design. System level modeling and testing. Field failures analyzed and root causes reported.</td>
<td>Refinement of testing systems – only testing critical or uncertain areas. Increased understanding of causes of failure allow deterministic failure rate prediction models.</td>
<td>The few field failures are fully analyzed and product designs or procurement specifications altered. Reliability testing done to augment reliability models.</td>
</tr>
<tr>
<td>DFR program status</td>
<td>No organized activities. No understanding of such activities.</td>
<td>Organization told reliability is important. DFR tools and processes inconsistently applied and only ‘when time permits’.</td>
<td>Implementation of DFR program with thorough understanding and establishment of each tool.</td>
<td>DFR program active in all areas of division – not just design &amp; mfg’ing. DFR normal part of R&amp;D and manufacturing.</td>
<td>Reliability improvement is a normal and continued activity.</td>
</tr>
<tr>
<td>Summation of reliability posture</td>
<td>“We don’t know why we have problems with reliability”</td>
<td>“Is it absolutely necessary to always have problems with reliability?”</td>
<td>“Through commitment and reliability improvement we are identifying and resolving our problems.”</td>
<td>“Failure prevention is a routine part of our operation.”</td>
<td>“We know why we do not have problems with reliability.”</td>
</tr>
</tbody>
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