ISO/IEC 15504 (SPICE)

A Status Report

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The SPICE Timeline

Improve IT

1991 - 1992
Study Group

1993 - 1995
SPICE Working Draft

1995 - 1998
Technical Report

1998 - 1999
Revision Proposal

1998 - 1999
PDTR

1998 - 1999
TR

1998 - 1999
Revision Proposal

2001 - 2006
IS Development

2003
Part 2

2004
Part 3

2004
Part 4

2004
Part 1

2006
Part 5

2005 - 2007
Part 6 (?)

SPICE2005– Klagenfurt
Achievements

- 4000 assessments performed worldwide
- In 45 countries
- Major sectors setting the pace
  - Space, Automotive, Defence, Aerospace, Medical Devices
- Major country initiatives
  - Initiated in Europe
  - Japan, Korea, Australia, Brazil
  - SME initiatives e.g. SPIRE, RAPID
- Microsoft Readiness Framework
Current Status

- Part 1
  - Published (Nov 2004)
- Part 2
  - Published (Oct 2003)
- Part 3
  - Published (Jan 2004)
- Part 4
  - Published (Sep 2004)
- Part 5
  - FCD ballot (closes 1 May 2005)
  - FDIS ballot (starts June 2005 (?))
Transition

- All assessment approaches in conformance with the requirements of ISO/IEC TR 15504 should transition to conformance with the requirements of ISO/IEC 15504-2 (published October 2003). TR 15504 is no longer available.

- All assessment approaches currently using the ISO/IEC TR 15504-5 exemplar assessment model should transition to use the exemplar Process Assessment Model in ISO/IEC 15504-5 from FCD status (December 2004).

- All assessor training courses based on the exemplar assessment model should be based on ISO/IEC FCD 15504-5 or later.
New Work items

- ISO/IEC 15504 Part 6
  - Exemplar systems process assessment model
  - Based on Process Reference Model in ISO/IEC 15288

- Organisational maturity framework consistent with ISO/IEC 15504
  - Views have crystallized over time regarding continuous and staged representations and models of process capability.
  - It is generally acknowledged that levels of organisational maturity can be defined in terms of defined profiles of process capability.
The Assessment Framework

Two-dimensional model for processes and process capability

- **Process Dimension**
  - Process Categories
  - Processes (P1, …, Pn)

- **Capability Dimension**
  - Capability Levels (CL1, …, CL5)
  - Process Attributes (PA1.1, PA2.2 … PA5.5)

Each process receives a capability level rating

This is referred to as a Continuous Model
Measurement Framework

Optimising
The process is continuously improved to meet relevant current and projected business goals.

Predictable
The process is enacted consistently within defined limits.

Established
A defined process is used based on a standard process.

Managed
The process is managed and work products are established, controlled and maintained.

Performed
The process is implemented and achieves its process purpose.

Incomplete
The process is not implemented or fails to achieve its purpose.

Level 5 Optimizing
PA.5.1 Process Innovation
PA.5.2 Continuous Improvement

Level 4 Predictable
PA.4.1 Process Measurement
PA.4.2 Process Control

Level 3 Established
PA.3.1 Process Definition
PA.3.2 Process Deployment

Level 2 Managed
PA.2.1 Performance Management
PA.2.2 Work Product Management

Level 1 Performed
PA.1.1 Process Performance

Level 0 Incomplete
ISO 15504 - Capability Levels “in practice”

1. Performed
   “We’re not doing that process”

2. Managed
   “We’re doing it, here are the products, but don’t ask how”

3. Established
   “Would you like to see our defined processes?”

4. Predictable
   “We can show you that we’re mostly on time and that the product matches requirements”

5. Optimising
   “Here are the improvements we’ve made since last time and their measurements”

“Here are our measurements showing how well we are doing”

SPICE2005 – Klagenfurt
Capability Levels and Process Attributes

**Optimizing**
The process is continuously improved to meet relevant current and projected business goals.

**Predictable**
The process is enacted consistently within defined limits.

**Established**
A defined process is used based on a standard process.

**Managed**
The process is managed and work products are established, controlled and maintained.

**Performed**
The process is implemented and achieves its process purpose.

**Incomplete**
The process is not implemented or fails to achieve its purpose.

---

**Level 0** Incomplete
The process is not implemented or fails to achieve its purpose.

**Level 1** Performed
The process is implemented and achieves its process purpose.

**Level 2** Managed
The process is enacted consistently within defined limits.

**Level 3** Established
A defined process is used based on a standard process.

**Level 4** Predictable
The process is enacted consistently within defined limits.

**Level 5** Optimising
The process is continuously improved to meet relevant current and projected business goals.

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**Level 0 Incomplete**
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**Level 5 Optimising**
The process is continuously improved to meet relevant current and projected business goals.

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**Covered by ISO 9001:2000**

- **Level 0 Incomplete**
- **Level 1 Performed**
- **Level 2 Managed**
- **Level 3 Established**
- **Level 4 Predictable**
- **Level 5 Optimising**

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**Performed**
The process is implemented and achieves its process purpose.

**Managed**
The process is managed and work products are established, controlled and maintained.

**Established**
A defined process is used based on a standard process.

**Predictable**
The process is enacted consistently within defined limits.

**Optimising**
The process is continuously improved to meet relevant current and projected business goals.
Process Reference and Assessment Models

ISO 15504-2
- Requirements for Conformity (Compatibility)
- Measurement Framework
- Requirements for Compliance

determine applicability of

Assessment Model

Process Reference Model

e.g. ISO 12207
determine suitability of
Process Reference Models

- 15504 Requirements
- Model Architecture
- Capability Levels
- Process Attributes

- Process Reference Model
- Model Requirements

- REQUIREMENTS
  - Performing an assessment
  - Process Reference Models
  - Process Assessment Models
  - Conformity assessment

- and Assessment Models
- 15504 Assessment Model
- OOSPICE
- Automotive SPICE
- ISO 9001 S9K

- 12207 based
  - (Software LCP)

SPICE2005 – Klagenfurt
<table>
<thead>
<tr>
<th>Process Reference Models</th>
<th>Standards-Based Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>12207 Software Lifecycle Process</td>
<td>ISO/IEC 12207 Amendment 1 and 2</td>
</tr>
<tr>
<td>15288 System Lifecycle Process</td>
<td>ISO/IEC 15288</td>
</tr>
<tr>
<td>18529 Human Centered Lifecycle Process</td>
<td>ISO/IEC 18529</td>
</tr>
<tr>
<td>ISO 9001 Quality Management</td>
<td>European Space Agency</td>
</tr>
<tr>
<td>Sector / Domain Based Process Reference and Assessment Models</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>SPACE</td>
<td></td>
</tr>
<tr>
<td>AUTOMOTIVE</td>
<td></td>
</tr>
<tr>
<td>Medical Device Software (Software Life Cycle Processes IEC 62304)</td>
<td></td>
</tr>
<tr>
<td>Component Based Development</td>
<td></td>
</tr>
<tr>
<td>IT Infrastructure Management</td>
<td></td>
</tr>
<tr>
<td>SPICE 4 SPACE European Space Agency</td>
<td></td>
</tr>
<tr>
<td>AUTOMOTIVE SPICE Procurement Forum / SPICE UG</td>
<td></td>
</tr>
<tr>
<td>MEDISPICE The SPICE User Group</td>
<td></td>
</tr>
<tr>
<td>OOSPICE</td>
<td></td>
</tr>
<tr>
<td>CRP Henri Tudor</td>
<td></td>
</tr>
</tbody>
</table>
Compatibility is the Key

- The process assessment standard must:
  - be supportive of and consistent with other systems and software engineering standards;
  - be supportive of and consistent with the ISO 9000 series of standards;
  - provide a migration path for existing methods so as to discourage the establishment of other de-facto standards.
Harmonising Different Approaches

Part 5

CL5
CL4
CL3
CL2
CL1
CL0

P1 P2 P3 .......... Pn

A common reference framework

CMMI

ISO9000:2000

OOSPICE

Automotive SPICE

ISO/IEC 15504 (SPICE): Current and Future Directions 1 December 2003
Automotive SPICE

Representative Organisations
VDA, MISRA, INCOSE

Goal
Common approach for assessing and evaluating suppliers based on ISO 15504 Automotive PRM
Automotive SPICE

- A common model for manufacturers specific to 'automotive'
- Subset of processes with application guidance for automotive
- A common and consistent way to use ISO 15504 for automotive assessments
- Builds on joint initiatives in Manufacturer groupings (e.g. HIS and 'Pan-Brand')

- Release date: May 2005
Manufacturer’s Approach

1. Establish **target capability levels** for requirements and/or suppliers
2. Determine the **software development capability** of the suppliers
3. **Evaluate** the risk
4. Exercise the necessary controls (contract and project) to **control the risk**

![Risk Time Graph](image-url)
Automotive SPICE – Processes

Acquirer-Supplier
- Technical Requirements
- Legal and Administrative Requirements
- Project Requirements
- Request for Proposals
- Supplier Tendering
- Supplier Qualification
- Contract Agreement
- Supplier Monitoring

Support
- Quality Assurance
- Verification
- Joint Review
- Documentation
- Configuration Management
- Problem Resolution Management
- Change Request Management

Management
- Project Management
- Risk Management
- Measurement

Process Improvement
- Process Improvement

Reuse
- Reuse Program Management

Supplemented by Guidance for Automotive Application

SPICE2005– Klagenfurt
ISO/IEC 15504 Certification

Providing confidence in the Assessment Results

- Certification Scheme under development
- Two levels of bodies – Assessment body and Certification body
- Underlying Target Maturity Model TMM©
- First certifications contracted 1st quarter 2006
## TYPE of Assessment

<table>
<thead>
<tr>
<th></th>
<th>Type A</th>
<th>Type B</th>
<th>Type C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independence</strong></td>
<td>Shall be independent</td>
<td>Clear separation of responsibilities of inspection staff</td>
<td>Adequate segregation of responsibilities by organisation and documented procedures</td>
</tr>
<tr>
<td><strong>Involvement in development</strong></td>
<td>Not allowed</td>
<td>Not allowed</td>
<td>Allowed</td>
</tr>
<tr>
<td><strong>Access to services</strong></td>
<td>To all parties in a non-discriminatory manner</td>
<td>Only to own organisation</td>
<td>No requirements</td>
</tr>
</tbody>
</table>
## CLASS of Assessment

<table>
<thead>
<tr>
<th></th>
<th>Class A</th>
<th>Class B</th>
<th>Class C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Amount of objective evidence</strong></td>
<td>High (three sources)</td>
<td>Medium (two sources)</td>
<td>Low (one source)</td>
</tr>
<tr>
<td><strong>Ratings generated</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Resource needs (order of magnitude)</strong></td>
<td>200+ person hours</td>
<td>24 – 80 person hours</td>
<td>8 – 24 person hours</td>
</tr>
<tr>
<td><strong>Assessment team composition</strong></td>
<td>A large team under a certified lead assessor</td>
<td>A team of two assessors lead by a certified lead assessor</td>
<td>A single assessor</td>
</tr>
<tr>
<td><strong>Typically</strong></td>
<td>“Process assessment of an organisation with high safety critical aspects”</td>
<td>“Process assessment of a business unit, product line or project”</td>
<td>“Quick look process assessment to develop short term improvement priorities (or as a stepping stone for class B assessment)”</td>
</tr>
</tbody>
</table>
Target Maturity Level (TMM)

TYPE A and CLASS 1/2 Assessments offered up for Certification

<table>
<thead>
<tr>
<th>Process</th>
<th>Capability</th>
<th>Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A A A A</td>
<td>E E</td>
</tr>
<tr>
<td>2</td>
<td>A B C C</td>
<td>D D E E</td>
</tr>
<tr>
<td>3</td>
<td>A B C D</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A B C</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>A B C</td>
<td></td>
</tr>
</tbody>
</table>
International Assessor Certification Scheme

Providing confidence in the assessors

- www.int-acs.org

- Purpose
  - To certify as competent, assessors trained and qualified in the principles and practices of assessing processes using ISO/IEC 15504.

- Intended for
  - Internal process assessors
  - External process assessors
  - Process practitioners

- Three assessor grades
  - Provisional assessor, Assessor, Principal assessor
SPICE 2005

eXtra event

“Podcasting live from SPICE 2005”
Keeping Informed

www.isospice.com