Measuring Operational Resilience

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Topics

CERT Resilience Management Model Overview
What Is the Question? What Should I Measure?
Measurement Defined
Key Measures
Getting Started
CERT-RMM Overview
What is CERT®-RMM?

The CERT® Resilience Management Model is a maturity model for managing and improving operational resilience.

“…an extensive super-set of the things an organization could do to be more resilient.”
- CERT-RMM adopter

- Process improvement for operational resilience
- Converges key operational risk management activities: security, BC/DR, and IT operations
- Defines maturity through capability levels (like CMMI)
- Improves confidence in how an organization responds in times of operational stress and disruption
# CERT-RMM: 26 Process Areas in 4 Categories

## Engineering
- **ADM**: Asset Definition and Management
- **CTRL**: Controls Management
- **RRD**: Resilience Requirements Development
- **RRM**: Resilience Requirements Management
- **RTSE**: Resilient Technical Solution Engineering
- **SC**: Service Continuity

## Operations Management
- **AM**: Access Management
- **EC**: Environmental Control
- **EXD**: External Dependencies
- **ID**: Identity Management
- **IMC**: Incident Management & Control
- **KIM**: Knowledge & Information Management
- **PM**: People Management
- **TM**: Technology Management
- **VAR**: Vulnerability Analysis & Resolution

## Enterprise Management
- **COMM**: Communications
- **COMP**: Compliance
- **EF**: Enterprise Focus
- **FRM**: Financial Resource Management
- **HRM**: Human Resource Management
- **OTA**: Organizational Training & Awareness
- **RISK**: Risk Management

## Process Management
- **MA**: Measurement and Analysis
- **MON**: Monitoring
- **OPD**: Organizational Process Definition
- **OPF**: Organizational Process Focus

*Full text of each process area is available for download at www.cert.org/resilience*
Organizational Context

Business Processes

Assets in Production

Operational Resilience Management Processes

CERT-RMM focuses here
For Comparison: CERT-RMM & CMMI

- Plan
- Design
- Develop
- Acquire
- Deploy
- Operate
- Decommission

CERT-RMM

CMMI-DEV
CMMI-ACQ
CMMI-SVC

DEVELOPMENT
OPERATION
What Is the Question?
What Should I Measure?
How Resilient Am I? - 1

When asked:

• How resilient am I?
• Am I resilient enough?
• How resilient do I need to be?

What does this mean?
How Resilient Am I? - 2

• Do I need to worry about operational resilience?

• If services are disrupted, will it make the news? Will I end up in court? in jail? Will I be able to stay in business?

• Do I meet compliance requirements?

• How resilient am I compared to my competition?

• Do I need to spend more $$ on resilience? If so, on what?

• What am I getting for the $$ I’ve already spent?
How Resilient Am I? - 3

What should I be measuring to determine if I am meeting my performance objectives for resilience?

What is the business value of being more resilient?
So What? Why Should I Care? (*)

- What decisions would this measure inform?
- What actions would I take based on it?
- What behaviors would it affect?
- What would improvement look like?
- What would its value be in comparison to other measures?

What Should I Measure?

Determine **business objectives** and key questions

Define the **information** that is needed to answer the question

**Qualify and quantify** the information in the form of measures

**Analyze** the measures and report out

Quantify the **value** of each measure (cost/benefit)

**Refine** and retire measures as you go
Who, What, Where, When, Why, How

**Who** is the measure for? Who are the stakeholders? Who collects the measurement data?

**What** is being measured? As part of what process?

**Where** is the data/information stored?

**When**/how frequently are the measures collected?

**Why** is the measure important (vs. others)? The most meaningful information is conveyed by reporting trends over time vs. point in time measures.

**How** is the data collected? How is the measure presented? How is the measure used?
Measurement Defined
Measurement Types

Implementation

- Is this process/activity/practice being performed?

Effectiveness

- How good is the work product or outcome of the process/activity/practice? Does it achieve the intended result?

Process performance

- Is the process performing as expected? Is it efficient? Can it be planned? Is it predictive? Is it in control?
Measurement Template

- Measure Name/ID
- Goal
- Question(s)
- Related Processes/Procedures
- Visual Display
- Data Input(s) (Data elements, Data type)
- Data Collection (How, When, How often, By whom)
- Data Reporting (By, To whom, When, How often)
- Data Storage (Where, How, Access control)
- Stakeholders (Information owner(s), collector(s), customer(s))
- Algorithm or Formula
- Interpretation or Expected Value(s)
A Few Strategic Measures
Given Organizational Objectives . . .

Measure 1
Percentage of resilience “activities”(*) that do not directly (or indirectly) support one or more organizational objectives

Measure 2
For each resilience “activity,” number of organizational objectives that require it to be satisfied (goal is = or > 1)

(*) “Activity” can be a project, task, performance objective, investment, etc. It represents some meaningful decomposition of the resilience program.
Given High-Value Services and Assets . . .

**Measure 3**
Percentage of high-value services that *do not* satisfy their allocated resilience requirements(*)

**Measure 4**
Percentage of high-value assets(+) that *do not* satisfy their allocated resilience requirements(*)

(*) confidentiality, availability, integrity; (+) technology, information, facilities, people
Given Controls . . .

**Measure 5**
Percentage of high-value services with controls that are ineffective or inadequate

**Measure 6**
Percentage of high-value assets with controls that are ineffective or inadequate
Given Risks . . .

Measure 7
Confidence factor that risks(*) from all sources that need to be identified have been identified

Measure 8
Percentage of risks with impact above threshold

(*) to high-value assets that could adversely affect the operation and delivery of high-value services
Given a Disruptive Event (*)

Measure 9
Probability of delivered service through a disruptive event

Measure 10
For disrupted, high-value services with a service continuity plan, percentage of services that did not deliver service as intended throughout the disruptive event

(*) An incident, a break in service continuity, a man-made or natural disaster or crisis
Top Ten Strategic Measures

1. Percentage of resilience “activities” that **do not** directly (or indirectly) support one or more organizational objectives

2. For each resilience “activity,” number of organizational objectives that require it to be satisfied (goal is = or > 1)

3. Percentage of high-value services that **do not** satisfy their allocated resilience requirements

4. Percentage of high-value assets that **do not** satisfy their allocated resilience requirements

5. Percentage of high-value services with controls that are ineffective or inadequate

6. Percentage of high-value assets with controls that are ineffective or inadequate

7. Confidence factor that risks from all sources that need to be identified have been identified

8. Percentage of risks with impact above threshold

9. Probability of delivered service through a disruptive event

10. For disrupted, high-value services with a service continuity plan, percentage of services that **did not** deliver service as intended throughout the disruptive event
If These Don’t Work For You . . .

Identify the high-level objectives for your resilience program

Define measures that demonstrate the extent to which objectives are (or are not) being met

Make sure the measures you are currently reporting support one or more objectives

Measurement is expensive; collect and report measures that inform decisions and affect behavior
Getting Started
To Get Started

- Identify sponsors and key stakeholders
- Define resilience objectives and key questions
- Determine information and processes that inform these
- Define and vet a small number of key measures
- Collect, analyze, report, refine
- Put a measurement process in place (start small)
References

CERT Podcast: Measuring Operational Resilience
http://www.cert.org/podcast/show/20111004allen.html


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