



# **A CMMI<sup>®</sup> Questionnaire to Identify Risks and Opportunities**

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**Version 2.0**

## **OVERVIEW**

This document contains a CMMI-based questionnaire designed to be used during CMMI appraisal or risk or opportunity identification activities to identify risks or opportunities. Processes for performing risk and opportunity identification are plentiful. Two such processes are the Software Risk Evaluation method<sup>1</sup> and CMMI appraisals<sup>2</sup>.

Appraisal or risk assessment teams can use the set of questions in this document during a CMMI appraisal activity or a risk or opportunity evaluation to probe an organization or project and identify barriers or enablers to achieving objectives or improvement goals. The output of the effort can then be used to begin an improvement planning effort within an organization or project.

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<sup>1</sup> SRE Method Description, Version 2.0, CMU/SEI-99-TR-029

<sup>2</sup> CMMI® V2.0 Method Definition Document (MDD)

## **PRACTICE AREAS AS SOURCES OF RISK OR OPPORTUNITY**

Figure 1 contains the Practice Areas in the CMMI organized by Capability Areas and Categories. Practice Areas serve as the basis for forming questions exploring potential sources of risk or opportunity in an organization. Using a CMMI appraisal or risk or opportunity identification method, structured interviews explore the practices within a Practice Area. With clear project objectives or improvement goals, an organization can identify a wide range of obstacles to achieving, or enablers for advancing, their objectives or goals using the CMMI Process Areas as a starting point during the interview sessions.

The lack of a practice, or difficulty in performing a practice could result in the formation of a weakness or risk statement. For example, if a project does not trace user requirements to the product components that implement the requirement (RDM 2.5), the discussion of this practice could cause concern about the project's ability to verify or validate the system to their customer's satisfaction. The same practice can also be a source of an opportunity statement which may enable a team to perform their work more effectively or efficiently. For example, if one project has adopted an advanced tool to trace user needs to user stories, to the sprint that implements these needs, to the component that exhibits the capability, and the test plans that verify and validate the capability, the discussion of this implementation may lead to the identification of a project-level strength and an opportunity to improve this practice throughout the organization. Appraisal findings and risk assessment findings enable organizations to begin improvement planning efforts.



Figure 1



## Requirements Development and Management

### How does your *project or team* elicit requirements, ensure common understanding by stakeholders, and align requirements, plans, and work products?

Doing: Ensuring Quality: RDM – Requirements Development and Management (Staged View: ML 2)

#### Probing Questions:

- How does your project or team ensure that customer's needs and expectations are satisfied?
- How does your project or team refine customer requirements into solution and interface or connection requirements?
- How does your project or team refine, derive, and allocate requirements to the functional solution and solution components?
- How does your project or team manage evolving customer needs and expectations?

#### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- RDM 1.1 Record requirements.
- RDM 2.1 Elicit stakeholder needs, expectations, constraints, and interfaces or connections.
- RDM 2.2 Transform stakeholder needs, expectations, constraints, and interfaces or connections into prioritized customer requirements.
- RDM 2.3 Develop an understanding with the requirements providers on the meaning of the requirements.
- RDM 2.4 Obtain commitment from project participants that they can implement the requirements.
- RDM 2.5 Develop, record, and maintain bidirectional traceability among requirements and activities or work products.
- RDM 2.6 Ensure that plans and activities or work products remain consistent with requirements.
- RDM 3.1 Develop and keep requirements updated for the solution and its components.
- RDM 3.2 Develop operational concepts and scenarios.
- RDM 3.3 Allocate the requirements to be implemented.
- RDM 3.4 Identify, develop, and keep updated interface or connection requirements.
- RDM 3.5 Ensure that requirements are necessary and sufficient.
- RDM 3.6 Balance stakeholder needs and constraints.
- RDM 3.7 Validate requirements to ensure the resulting solution will perform as intended in the target environment.

#### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |  |
|--|--|
| <input type="checkbox"/> Functional architecture               | <input type="checkbox"/> Needs and/or Technical performance requirements |
| <input type="checkbox"/> Organizational process                | <input type="checkbox"/> New/Derived and/or product requirements         |
| <input type="checkbox"/> Technical Solutions Plan              | <input type="checkbox"/> Evidence of Adequate Resources and Tools        |
| <input type="checkbox"/> Requirements for verification process | <input type="checkbox"/> Customer requirements documents and/or baseline |



## Process Quality Assurance

**How does your *project or team* verify and enable improvement of the quality of the performed processes and resulting work products.?**

Doing: Ensuring Quality: PQA – Process Quality Assurance (Staged View: ML 2)

### Probing Questions:

- How does your project or team increase the consistent use and improvement of the processes to maximize business benefit and customer satisfaction.?
- How does your project or team promote an environment that encourages personnel to participate in identifying and reporting quality issues?
- What activities are defined in your quality plan? Are they being performed?
- How does your project periodically report results of process and product quality assurance to those affected?
- Are project personnel informed of quality review/audit results?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- PQA 1.1 Identify and address process and work product issues.
- PQA 2.1 Develop, keep updated, and follow a quality assurance approach and plan based on historical quality data.
- PQA 2.2 Throughout the project, objectively evaluate selected performed processes and work products against the recorded process and applicable standards.
- PQA 2.3 Communicate quality and non-compliance issues and ensure their resolution.
- PQA 2.4 Record and use results of quality assurance activities.
- PQA 3.1 Identify and record opportunities for improvement during quality assurance activities.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |  |
|---|--|
| <input type="checkbox"/> Process Quality Assurance Plan       | <input type="checkbox"/> Quality Assurance reporting to customer       |
| <input type="checkbox"/> Quality Assurance personnel assigned | <input type="checkbox"/> Corrective/Preventive action reports (C/PARs) |
| <input type="checkbox"/> Audit records and reports            |  |
| <input type="checkbox"/> Results/minutes of quality reviews   |  |



## Verification and Validation

**How does your *project or team* confirm selected solutions and components meet their requirements and validate selected solutions and components fulfill their intended use in their target environment?**

Doing: Ensuring Quality: VV – Verification and Validation (Staged View: ML 3)

### Probing Questions:

- How does your project or team verify and validate selected solutions and components throughout the project to increase the likelihood that the solution will satisfy the customer?
- How does your project or team know whether the work product and solution properly reflects the specified requirements, i.e., “you are building it right.”?
- How does your project or team demonstrate that the solution will fulfill its intended use in its target environment, i.e., “you are building the right thing.”?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- VV 1.1 Perform verification to ensure the requirements are implemented and record and communicate results.
- VV 1.2 Perform validation to ensure the solution will function as intended in its target environment and record and communicate results.
- VV 2.1 Select components and methods for verification and validation.
- VV 2.2 Develop, keep updated, and use the environment needed to support verification and validation.
- VV 2.3 Develop, keep updated, and follow procedures for verification and validation.
- VV 3.1 Develop, keep updated, and use criteria for verification and validation.
- VV 3.2 Analyze and communicate verification and validation results.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |   |
|---|---|
| <input type="checkbox"/> Project V&V Plans                        | <input type="checkbox"/> V&V Issue and Defect Logs            |
| <input type="checkbox"/> V&V Traceability Matrix                  | <input type="checkbox"/> Performance and Analysis Reports     |
| <input type="checkbox"/> Requirements Traceability Matrix         | <input type="checkbox"/> DR problem report trends/aging, etc  |
| <input type="checkbox"/> Effort expended for rework               | <input type="checkbox"/> Work product inspection logs/results |
| <input type="checkbox"/> Verification and Validation Environments | <input type="checkbox"/> Customer acceptance plans            |



## Peer Reviews

**How does your *project or team* identify and address work product issues through reviews by the producer's peers or Subject Matter Experts (SMEs)?**

Doing: Ensuring Quality: PR – Peer Reviews (Staged View: ML 3)

<b>Probing Questions:</b>
---------------------------

- |   |
|---|
| <ul style="list-style-type: none"><li>• How does your project or team reduce cost and rework by uncovering issues or defects early?</li><li>• How does your project or team perform peer reviews incrementally as work products are developed?</li><li>• How does your project or team ensure that participants are objective and candid about their evaluations?</li><li>• How do you decide which work products need to be reviewed by peers?</li></ul> |
|---|

<b>CMMI Practices:</b>
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Are there risks or opportunities associated with the way the project or team tries to:
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- |  |
|--|
| <ul style="list-style-type: none"><li>• PR 1.1      Perform reviews of work products and record issues.</li><li>• PR 2.1      Develop and keep updated procedures and supporting materials used to prepare for and perform peer reviews.</li><li>• PR 2.2      Select work products to be peer reviewed.</li><li>• PR 2.3      Prepare and perform peer reviews on selected work products using established procedures.</li><li>• PR 2.4      Resolve issues identified in peer reviews.</li><li>• PR 3.1      Analyze results and data from peer reviews.</li></ul> |
|--|

<b>Additional Topics:</b>
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Potential Sources of Risk or Opportunity:
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- |   |  |
|---|--|
| <input type="checkbox"/> Peer reviewed work products          | <input type="checkbox"/> Peer review Issue and Defect Logs |
| <input type="checkbox"/> Levels of peer reviews               | <input type="checkbox"/> Peer review participants          |
| <input type="checkbox"/> Training on peer review process      | <input type="checkbox"/> Role of QA in peer review         |
| <input type="checkbox"/> Management or customer participation | <input type="checkbox"/> Rework tracking                   |
| <input type="checkbox"/> Preparation and review time          | <input type="checkbox"/> Use of SMEs and senior reviewers  |





## Technical Solution

### How does your *project or team* design and build solutions that meet customer requirements?

Doing: Engineering & Developing Products: TS – Technical Solution (Staged View: ML 3)

#### Probing Questions:

- How does your project or team provide cost-effective designs and solutions that meet customer requirements and reduce rework?
- How does your project or team perform design and build solutions that meet customer, functional, and quality requirements?
- How is your product design used to implement a solution?

#### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- TS 1.1 Build solution to meet requirements.
- TS 2.1 Design and build a solution to meet requirements.
- TS 2.2 Evaluate the design and address identified issues.
- TS 2.3 Provide guidance on use of the solution.
- TS 3.1 Develop criteria for design decisions.
- TS 3.2 Develop alternative solutions for selected components.
- TS 3.3 Perform a build, buy, or reuse analysis.
- TS 3.4 Select solutions based on design criteria.
- TS 3.5 Develop, keep updated, and use information needed to implement the design.
- TS 3.6 Design solution interfaces or connections using established criteria.

#### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |   |
|--|---|
| <input type="checkbox"/> Technical Solutions plan        | <input type="checkbox"/> Documented design selection criteria |
| <input type="checkbox"/> Defined design methodologies    | <input type="checkbox"/> Documented design                    |
| <input type="checkbox"/> Results of Cost Modeling/Trades | <input type="checkbox"/> Handling of change proposals         |



## Product Integration

### How does your *project or team* integrate and deliver the solution that addresses functionality and quality requirements?

Doing: Engineering & Developing Products: PI – Product Integration (Staged View: ML 3)

#### Probing Questions:

- How does your project or team increase customer satisfaction by giving them a solution that meets or exceeds their functionality and quality requirements?
- How does your project or team manage and ensure compatibility among the interfaces or connections of product components?
- How does your project or team verify and validate each successive build according to the integration strategy, in the target environment, and according to procedures and criteria?

#### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- PI 1.1 Assemble solutions and deliver to the customer.
- PI 2.1 Develop, keep updated, and follow an integration strategy.
- PI 2.2 Develop, keep updated, and use the integration environment.
- PI 2.3 Develop, keep updated, and follow procedures and criteria for integrating solutions and components.
- PI 2.4 Confirm, prior to integration, that each component has been properly identified and operates according to its requirements and design.
- PI 2.5 Evaluate integrated components to ensure conformance to the solution's requirements and design.
- PI 2.6 Integrate solutions and components according to the integration strategy.
- PI 3.1 Review and keep updated interface or connection descriptions for coverage, completeness, and consistency throughout the solution's life.
- PI 3.2 Confirm, prior to integration, that component interfaces or connections comply with interface or connection descriptions.
- PI 3.3 Evaluate integrated components for interface or connection compatibility.

#### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |   |
|--|---|
| <input type="checkbox"/> Integration and test plan | <input type="checkbox"/> Acceptance test cases, procedures, and results |
| <input type="checkbox"/> Interface documentation   | <input type="checkbox"/> Documentation of the integration environment   |
| <input type="checkbox"/> Integration team          | <input type="checkbox"/> Evidence that products are inspected/reviewed  |



## Service Delivery Management

### How does your *project or team* deliver services and manage the service delivery system?

Doing: Delivering & Managing Services: SDM – Service Delivery Management (Staged View: ML 2)

#### Probing Questions:

- How does your project or team increase customer satisfaction by delivering services that meet or exceed customer expectations?
- How does your project or team define and establish the relationship between the service provider and customers, including end users?
- How does your project or team maintain service delivery performance when changes occur?

#### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- SDM 1.1 Use the service system to deliver services.
- SDM 2.1 Develop, record, keep updated, and follow service agreements.
- SDM 2.2 Receive and process service requests in accordance with service agreements.
- SDM 2.3 Deliver services in accordance with service agreements.
- SDM 2.4 Analyze existing service agreements and service data to prepare for updated or new agreements.
- SDM 2.5 Develop, record, keep updated, and follow the approach for operating and changing the service system.
- SDM 2.6 Confirm the readiness of the service system to support the delivery of services.
- SDM 3.1 Develop, record, keep updated, and use organizational standard service systems and agreements.

#### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |  |
|---|--|
| <input type="checkbox"/> Service level agreements   | <input type="checkbox"/> Validity of results               |
| <input type="checkbox"/> Undocumented expectations  | <input type="checkbox"/> Customer satisfaction             |
| <input type="checkbox"/> Conflicts in requests      | <input type="checkbox"/> Service system adaptability       |
| <input type="checkbox"/> Precedence of requests     | <input type="checkbox"/> Planned and unplanned maintenance |
| <input type="checkbox"/> Security of service system |  |



## Strategic Service Management

### How does your *project or team* develop and deploy standard services that are compatible with strategic business needs and plans?

Doing: Delivering & Managing Services: STSM – Strategic Service Management (Staged View: ML 3)

#### Probing Questions:

- How does your project or team increase the likelihood of meeting business objectives by aligning standard services with customer needs?
- How does your project or team analyze capabilities and needs for services that can span multiple customers and agreements?
- How does your project or team get the information needed to make effective strategic decisions about the set of standard services that the organization offers and maintains?

#### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- STSM 1.1 Develop a list of current services.
- STSM 2.1 Develop, keep updated, and use descriptions of current services.
- STSM 2.2 Collect, record, and analyze data about strategic needs and capabilities for service delivery.
- STSM 2.3 Develop, keep updated, and follow an approach for providing new or changed services derived from strategic needs and capabilities.
- STSM 3.1 Develop, keep updated, and use the set of organizational standard services and service levels.

#### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |  |
|--|--|
| <input type="checkbox"/> Strategic plans             | <input type="checkbox"/> Common customer needs                       |
| <input type="checkbox"/> Conflicting customer needs  | <input type="checkbox"/> Service system catalog                      |
| <input type="checkbox"/> Standard service offerings  | <input type="checkbox"/> Ability to quickly respond to new needs     |
| <input type="checkbox"/> Level of tailoring required | <input type="checkbox"/> Configuration management of common services |



## Supplier Source Selection

**How does your *project or team* develop and keep updated a package of materials used to seek proposals from potential suppliers and select one or more suppliers to deliver the solution?**

Doing: Selecting & Managing Suppliers: SSS – Supplier Source Selection (Staged View: ML 2)

### Probing Questions:

- How does your project or team improve the ability to select the most qualified suppliers to deliver solutions?
- How does your project or team define and keep updated ground rules for initial communication and interaction with potential suppliers?
- How does your project or team define and use the roles and responsibilities of affected stakeholders and potential suppliers?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- SSS 1.1 Determine the type of acquisition.
- SSS 1.2 Identify potential suppliers and distribute requests for proposals
- SSS 1.3 Evaluate proposals and select suppliers.
- SSS 2.1 Develop a solicitation package and keep it updated.
- SSS 2.2 Identify qualified potential suppliers and distribute the solicitation package for their response.
- SSS 2.3 Evaluate proposed solutions according to recorded evaluation criteria and select suppliers.
- SSS 3.1 Develop, keep updated, and follow negotiation approaches for soliciting, evaluating, and selecting suppliers.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |  |
|--|--|
| <input type="checkbox"/> Supplier evaluation criteria              | <input type="checkbox"/> Preferred supplier agreements   |
| <input type="checkbox"/> Records of supplier evaluation activities | <input type="checkbox"/> Past performance evaluation     |
| <input type="checkbox"/> Negotiation plans                         | <input type="checkbox"/> Risk assessments                |
| <input type="checkbox"/> Assumptions and Constraints               | <input type="checkbox"/> Conflict of interest management |



## Supplier Agreement Management

**How does your *project or team* establish an agreement with selected suppliers, ensure that the supplier and the acquirer perform according to the terms over the course of the agreement, and evaluate the supplier's deliverables?**

Doing: Selecting & Managing Suppliers: SAM – Supplier Agreement Management (Staged View: ML 2)

### Probing Questions:

- How does your project or team provide an explicit understanding between the acquirer and supplier to maximize the success of agreed-on efforts to deliver a supplier deliverable?
- How does your project or team ensure the supplier agreement provides a mutual understanding between the acquirer and supplier and serves as the basis for managing their relationship?
- How does your project or team gauge a supplier's technical progress and allow effective management of technical risks?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- SAM 1.1 Develop and record the supplier agreement.
- SAM 1.2 Accept or reject the supplier deliverables.
- SAM 1.3 Process supplier invoices.
- SAM 2.1 Monitor supplier as specified in the supplier agreement and keep agreement updated.
- SAM 2.2 Perform activities as specified in the supplier agreement.
- SAM 2.3 Verify that the supplier agreement is satisfied before accepting the acquired supplier deliverable.
- SAM 2.4 Manage invoices submitted by the supplier according to the supplier agreements.
- SAM 3.1 Select technical supplier deliverables for analysis and conduct technical reviews.
- SAM 3.2 Select and monitor supplier processes and deliverables based on criteria in the supplier agreement.
- SAM 4.1 Select measures and apply analytical techniques to quantitatively manage supplier performance to achieve quality and process performance objectives.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |  |
|--|--|
| <input type="checkbox"/> Supplier progress meeting results/minutes | <input type="checkbox"/> Performance metrics and trends                |
| <input type="checkbox"/> Performance issues and/or action items    | <input type="checkbox"/> Supplier process performance                  |
| <input type="checkbox"/> Updated plans, products, activities       | <input type="checkbox"/> Managing security and controlled information  |
| <input type="checkbox"/> Identification of stakeholders            | <input type="checkbox"/> Timely payment of invoices for work performed |



## Estimation

**How does your *project or team* estimate the size, effort, duration, and cost of the work and resources needed to develop, acquire, or deliver the solution?**

Managing: Planning & Managing Work: ETS – Estimation (Staged View: ML 2)

### Probing Questions:

- How does your project or team make commitments, plan, and reduce uncertainty, allowing for early corrective actions and increasing the likelihood of meeting objectives?
- How does your project or team take into consideration the scope, size, and complexity of the work?
- How does your project or team use historical data when planning future work and to calibrate estimation formulas and models?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- EST 1.1 Develop high-level estimates to perform the work.
- EST 2.1 Develop, keep updated, and use the scope of what is being estimated.
- EST 2.2 Develop and keep updated estimates for the size of the solution.
- EST 2.3 Based on size estimates, develop and record effort, duration, and cost estimates and their rationale for the solution.
- EST 3.1 Develop and keep updated a recorded estimation method.
- EST 3.2 Use the organizational measurement repository and process assets for estimating work.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |  |
|---|--|
| <input type="checkbox"/> Availability of historical data  | <input type="checkbox"/> Parametric modeling tools           |
| <input type="checkbox"/> Similarity of past work          | <input type="checkbox"/> Ability to measure size             |
| <input type="checkbox"/> Reliance on expert opinion alone | <input type="checkbox"/> Homogeneity of work                 |
| <input type="checkbox"/> Estimating unprecedented work    | <input type="checkbox"/> Estimating effort of external teams |



## Planning

**How does your *project or team* develop plans to describe what is needed to accomplish the work within the standards and constraints of the organization?**

Managing: Planning & Managing Work: PLAN – Planning (Staged View: ML 2)

### Probing Questions:

- How does your project or team optimize cost, functionality, and quality to increase the likelihood of meeting objectives?
- How does your project or team identify the appropriate set of stakeholders and tasks?
- How does your project or team manage capacity and availability of key resources ensuring their ability to meet the needs of projects and teams?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- PLAN 1.1 Develop a list of tasks.
- PLAN 1.2 Assign people to tasks.
- PLAN 2.1 Develop and keep updated the approach for accomplishing the work.
- PLAN 2.2 Plan for the knowledge and skills needed to perform the work.
- PLAN 2.3 Based on recorded estimates, develop and keep the budget and schedule updated.
- PLAN 2.4 Plan the involvement of identified stakeholders.
- PLAN 2.5 Plan transition to operations and support.
- PLAN 2.6 Ensure plans are feasible by reconciling available and estimated resources.
- PLAN 2.7 Develop the project plan, ensure consistency among its elements, and keep it updated.
- PLAN 2.8 Review plans and obtain commitments from affected stakeholders.
- PLAN 3.1 Use the organization's set of standard processes and tailoring guidelines to develop, keep updated, and follow the project process.
- PLAN 3.2 Develop a plan and keep it updated, using the project process, the organization's process assets, and the measurement repository.
- PLAN 3.3 Identify and negotiate critical dependencies.
- PLAN 3.4 Plan for the project environment and keep it updated based on the organization's standards.
- PLAN 4.1 Use statistical and other quantitative techniques to develop and keep the project processes updated to enable achievement of the quality and process performance objectives.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |   |
|---|---|
| <input type="checkbox"/> Integration of project plans:  | <input type="checkbox"/> Management training for planning           |
| <input type="checkbox"/> QA <input type="checkbox"/> CM <input type="checkbox"/> Test <input type="checkbox"/> Delivery | <input type="checkbox"/> People assigned responsibility and trained |
| <input type="checkbox"/> Estimation models/Results/BOE  | <input type="checkbox"/> Risk Identification/Analysis               |
| <input type="checkbox"/> Evidence of Adequate Resources and Tools   | <input type="checkbox"/> Task planning                              |
| <input type="checkbox"/> Project schedules and/or dependencies  | <input type="checkbox"/> Stakeholder coordination                   |





## Monitor and Control

**How does your *project or team* provide an understanding of the project progress so appropriate corrective actions can be taken when performance deviates significantly from plans?**

Managing: Planning & Managing Work: MC – Monitor and Control (Staged View: ML 2)

### Probing Questions:

- How does your project or team increase the probability of meeting objectives by taking early actions to adjust for significant performance deviations?
- How does your project or team track actuals against estimates to support managing the expectations of customers and stakeholders?
- How does your project or team resolve significant deviations from project plans, define and track these actions to closure?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- MC 1.1 Record task completions.
- MC 1.2 Identify and resolve issues.
- MC 2.1 Track actual results against estimates for size, effort, schedule, resources, knowledge and skills, and budget.
- MC 2.2 Track the involvement of identified stakeholders and commitments.
- MC 2.3 Monitor the transition to operations and support.
- MC 2.4 Take corrective actions when actual results differ significantly from planned results and manage to closure.
- MC 3.1 Manage the project using the project plan and the project process.
- MC 3.2 Manage critical dependencies and activities.
- MC 3.3 Monitor the work environment to identify issues.
- MC 3.4 Manage and resolve issues with affected stakeholders.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |  |
|---|--|
| <input type="checkbox"/> Revised project plans                    | <input type="checkbox"/> Actions based on data over intuition          |
| <input type="checkbox"/> Evidence of Adequate Resources and Tools | <input type="checkbox"/> Records of commitment reviews                 |
| <input type="checkbox"/> Record of critical facility usage        | <input type="checkbox"/> Corrective action plan                        |
| <input type="checkbox"/> Status reports                           | <input type="checkbox"/> Documented project and/or milestone reviews   |
| <input type="checkbox"/> Action items                             | <input type="checkbox"/> Transition to operations and support progress |



## Risk and Opportunity Management

### How does your *project or team* identify, record, analyze, and manage potential risks or opportunities?

Managing: Managing Business Resilience: RSK – Risk & Opportunity Management (Staged View: ML 3)

#### Probing Questions:

- How does your project or team mitigate adverse impacts or capitalize on positive impacts to increase the likelihood of meeting objectives?
- How does your project or team work with affected stakeholders to identify risks and opportunities early and continuously?
- How does your project or team determine which risks or opportunities are worth pursuing?
- How does your project or team evolve from reactively identifying uncertainties to systematically planning, anticipating, and handling them?

#### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- RSK 1.1 Identify and record risks or opportunities and keep them updated.
- RSK 2.1 Analyze identified risks or opportunities.
- RSK 2.2 Monitor identified risks or opportunities and communicate status to affected stakeholders.
- RSK 3.1 Identify and use risk or opportunity categories.
- RSK 3.2 Define and use parameters for risk or opportunity analysis and handling.
- RSK 3.3 Develop and keep updated a risk or opportunity management strategy.
- RSK 3.4 Develop and keep updated risk or opportunity management plans.
- RSK 3.5 Manage risks or opportunities by implementing planned risk or opportunity management activities.

#### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |  |
|--|--|
| <input type="checkbox"/> Risk and Opportunity plans                            | <input type="checkbox"/> Contingency plans                           |
| <input type="checkbox"/> Risk register   | <input type="checkbox"/> Prioritization schemes                      |
| <input type="checkbox"/> Analysis parameters                                   | <input type="checkbox"/> Opportunity identification and optimization |
| <input type="checkbox"/> Risk sharing across team or organizational boundaries | <input type="checkbox"/> Robustness of identification processes      |



## Incident Resolution & Prevention

**How does your *project or team* resolve and prevent disruptions promptly to sustain service delivery levels?**

Managing: Managing Business Resilience: IRP – Incident Resolution & Prevention (Staged View: ML 3)

### Probing Questions:

- How does your project or team minimize the impact of disruptions to meet objectives and customer commitments more effectively?
- How does your project or team address incidents in a timely and effective manner according to the terms of applicable customer agreements and requirements?
- How does your project or team address incidents reported by customers, end users, and affected stakeholders?
- How does your project or team identify and resolve the root cause of incidents?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- IRP 1.1 Record and resolve incidents.
- IRP 2.1 Develop, keep updated, and follow an approach for incident resolution and prevention.
- IRP 2.2 Monitor and resolve each incident to closure.
- IRP 2.3 Communicate incident status.
- IRP 3.1 Develop, keep updated, and use an incident management system for processing and tracking incidents and their resolution.
- IRP 3.2 Analyze selected incident and resolution data for prevention of future incidents.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |   |
|--|---|
| <input type="checkbox"/> Undocumented incidents                  | <input type="checkbox"/> Metrics and trend analysis               |
| <input type="checkbox"/> Incident management system availability | <input type="checkbox"/> Robust root cause analysis techniques    |
| <input type="checkbox"/> Visibility into incidents               | <input type="checkbox"/> Realistic solutions to fix future issues |
| <input type="checkbox"/> Timeliness of resolution actions        | <input type="checkbox"/> Data to ensure fixes perform as expected |



**How does your *project or team* plan mitigation activities for significant disruptions to business operations so that work can continue or resume?**

Managing: Managing Business Resilience: CONT – Continuity (Staged View: ML 3)

Probing Questions:
<ul style="list-style-type: none"> <li>• How does your project or team enable continued operation when serious disruptions or catastrophic events occur?</li> <li>• How does your project or team prepare business systems, people, and resources for disruptions in operations so that a minimum critical level of operations can continue?</li> <li>• How does your project or team identify minimum essential functions and resources, along with acceptable time limits for restoration of operations?</li> <li>• How does your project or team determine the effectiveness of continuity plans in an actual emergency or significant disruption?</li> </ul>

CMMI Practices:
Are there risks or opportunities associated with the way the project or team tries to:
<ul style="list-style-type: none"> <li>• CONT 1.1 Develop contingency approaches for managing significant disruptions to operations.</li> <li>• CONT 2.1 Identify and prioritize functions essential for continuity.</li> <li>• CONT 2.2 Identify and prioritize resources essential for continuity.</li> <li>• CONT 2.3 Develop, keep updated, and follow continuity plans to resume performing essential functions.</li> <li>• CONT 3.1 Develop and keep updated materials for continuity training.</li> <li>• CONT 3.2 Provide and evaluate continuity training according to the plan.</li> <li>• CONT 3.3 Prepare, conduct, and analyze results from verification and validation of the continuity plan.</li> </ul>

Additional Topics:	
Potential Sources of Risk or Opportunity:	
<input type="checkbox"/> Undefined service components	<input type="checkbox"/> Lack of training
<input type="checkbox"/> Unrealistic recovery expectations	<input type="checkbox"/> Undocumented expectations
<input type="checkbox"/> Operationally critical functions and resources	<input type="checkbox"/> Lack of plan validation
<input type="checkbox"/> Lack of resources	<input type="checkbox"/> Complex interactions
<input type="checkbox"/> Realistic scenarios	



## Organizational Training

**How does your *organization* develop the skills and knowledge of personnel so they perform their roles efficiently and effectively?**

Managing: Managing the Workforce: OT – Organizational Training (Staged View: ML 3)

### Probing Questions:

- How does your organization enhance individuals' skills and knowledge to improve organizational work performance?
- How does your training program support the organization's business objectives, and training needs that are common across projects and support groups?
- How does your organization assess training effectiveness (against organizational training needs) and communicate results?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- OT 1.1 Train people.
- OT 2.1 Identify training needs.
- OT 2.2 Train personnel and keep records.
- OT 3.1 Develop and keep updated the organization's strategic and short-term training needs.
- OT 3.2 Coordinate training needs and delivery between the projects and the organization.
- OT 3.3 Develop, keep updated, and follow organizational strategic and short-term training plans.
- OT 3.4 Develop, keep updated, and use a training capability to address organizational training needs.
- OT 3.5 Assess the effectiveness of the organization's training program.
- OT 3.6 Record, keep updated, and use the set of organizational training records.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |  |
|---|--|
| <input type="checkbox"/> Organizational training plan | <input type="checkbox"/> Training instructors                    |
| <input type="checkbox"/> Informal training            | <input type="checkbox"/> Funding for training activities         |
| <input type="checkbox"/> Training transcripts         | <input type="checkbox"/> Project-level training plans            |
| <input type="checkbox"/> Training competency          | <input type="checkbox"/> Product, project, and process overviews |
| <input type="checkbox"/> Training evaluations         |  |



## Causal Analysis and Resolution

**How does your *project or team* identify causes of selected outcomes and take action to either prevent recurrence of undesirable outcomes or ensure recurrence of positive outcomes?**

Enabling: Supporting Implementation: CAR – Causal Analysis and Resolution (Staged View: ML 3)

### Probing Questions:

- How does your project or team address root cause issues to eliminate rework and directly improve quality and productivity?
- How does your project or team select targets for root cause analysis?
- What techniques does your project or team use to get to the root cause of selected outcomes?
- How does your project or team submit effective improvements to the organizational level for potential deployment in the organizational processes?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- CAR 1.1 Identify and address causes of selected outcomes.
- CAR 2.1 Select outcomes for analysis.
- CAR 2.2 Analyze and address causes of outcomes.
- CAR 3.1 Determine root causes of selected outcomes by following an organizational process.
- CAR 3.2 Propose actions to address identified root causes.
- CAR 3.3 Implement selected action proposals.
- CAR 3.4 Record root cause analysis and resolution data.
- CAR 3.5 Submit improvement proposals for changes proven to be effective.
- CAR 4.1 Perform root cause analysis of selected outcomes using statistical and other quantitative techniques.
- CAR 4.2 Evaluate the effect of implemented actions on process performance using statistical and other quantitative techniques.
- CAR 5.1 Use statistical and other quantitative techniques to evaluate other solutions and processes to determine if the resolution should be applied on a broader scale.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |   |
|---|---|
| <input type="checkbox"/> Action plans                           | <input type="checkbox"/> Measures of performance and performance change |
| <input type="checkbox"/> Defect data                            | <input type="checkbox"/> Causal analysis feedback                       |
| <input type="checkbox"/> Causal analysis and resolution records | <input type="checkbox"/> Inspection log data                            |
| <input type="checkbox"/> Cause & Effect analysis tools          | <input type="checkbox"/> Defect type categories                         |



## Decision Analysis and Resolution

**How does your *project or team* make and record decisions using a recorded process that analyzes alternatives?**

Enabling: Supporting Implementation: DAR – Decision Analysis and Resolution (Staged View: ML 3)

### Probing Questions:

- How does your project or team increase the objectivity of decision making and the probability of selecting the optimal solution?
- How does your project or team decide which decisions should be subject to a structured, criteria-based decision-making process?
- How does your project or team apply criteria-based decision-making processes to technical or nontechnical alternatives?
- How does your project or team identify and involve affected stakeholders in the decision process?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- DAR 1.1 Define and record the alternatives.
- DAR 1.2 Make and record the decision.
- DAR 2.1 Develop, keep updated, and use rules to determine when to follow a recorded process for criteria-based decisions.
- DAR 2.2 Develop criteria for evaluating alternatives.
- DAR 2.3 Identify alternative solutions.
- DAR 2.4 Select evaluation methods.
- DAR 2.5 Evaluate and select solutions using criteria and methods.
- DAR 3.1 Develop, keep updated, and use a description of role-based decision authority.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |  |
|---|--|
| <input type="checkbox"/> Trade studies                | <input type="checkbox"/> Qualitative criteria      |
| <input type="checkbox"/> Supplier selection processes | <input type="checkbox"/> Quantitative criteria     |
| <input type="checkbox"/> Objective criteria weights   | <input type="checkbox"/> Make/buy/Re-use decisions |



## Configuration Management

**How does your *project or team* manage the integrity of work products using configuration identification, version control, change control, and audits?**

Enabling: Supporting Implementation: CM – Configuration Management (Staged View: ML 2)

### Probing Questions:

- How does your project or team reduce loss of work and increase the ability to deliver the correct version of the solution to the customer?
- How does your project or team control work products developed or modified by the project?
- How does your project or team systematically monitor and control changes to baselines and work products?
- How does your project or team provide approved versions of work products for use by the project team or customer?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- CM 1.1 Perform version control.
- CM 2.1 Identify items to be placed under configuration management.
- CM 2.2 Develop, keep updated, and use a configuration and change management system.
- CM 2.3 Develop or release baselines for internal use or for delivery to the customer.
- CM 2.4 Manage changes to the items under configuration management.
- CM 2.5 Develop, keep updated, and use records describing items under configuration management.
- CM 2.6 Perform configuration audits to maintain the integrity of configuration baselines, changes, and content of the configuration management system.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |   |
|--|---|
| <input type="checkbox"/> Controlled Artifacts                    | <input type="checkbox"/> Change Requests and/or metrics               |
| <input type="checkbox"/> SCM/Configuration Management Plan       | <input type="checkbox"/> CCB Minutes                                  |
| <input type="checkbox"/> Configuration Management Status Reports | <input type="checkbox"/> CM tool training                             |
| <input type="checkbox"/> Revision history of configured items    | <input type="checkbox"/> Multiple baseline management                 |
| <input type="checkbox"/> CM Professional Assigned                | <input type="checkbox"/> Cross-site or geographically dispersed teams |





## Governance

### How does your *organization* provide guidance to senior management on their role in the sponsorship and governance of process activities?

Improving: Sustaining Habit and Persistence: GOV – Governance (Staged View: ML 2)

#### Probing Questions:

- How does your organization minimize the cost of process implementation, increase the likelihood of meeting objectives, and ensure that the implemented processes support and contribute to the success of the business?
- How involved is senior management in the organization's process implementation?
- How does your organization improve process sustainment and integration throughout the organization?
- What roles do senior managers perform across the set of organizational or project processes?

#### CMMI Practices:

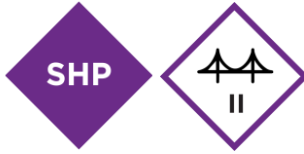
Are there risks or opportunities associated with the way the project or team tries to:

- GOV 1.1 Senior management identifies what is important for doing the work and defines the approach needed to accomplish the objectives of the organization.
- GOV 2.1 Senior management defines, keeps updated, and communicates organizational directives for process implementation and improvement based on organization needs and objectives.
- GOV 2.2 Senior management ensures resources and training are provided for developing, supporting, performing, improving, and evaluating adherence to expected processes.
- GOV 2.3 Senior management identifies their information needs, and uses the collected information to provide governance and oversight of effective process implementation and improvement.
- GOV 2.4 Senior management holds people accountable for adhering to organization directives and achieving process implementation and improvement objectives.
- GOV 3.1 Senior management ensures that measures supporting objectives throughout the organization are collected, analyzed, and used.
- GOV 3.2 Senior management ensures that competencies and processes are aligned with the objectives of the organization.
- GOV 4.1 Senior management ensures that selected decisions are driven by statistical and quantitative analysis related to performance and achievement of quality and process performance objectives.

#### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |  |
|---|--|
| <input type="checkbox"/> Level of senior management involvement | <input type="checkbox"/> Organizational champions for improvement    |
| <input type="checkbox"/> Resources provided for improvement     | <input type="checkbox"/> Active visibility of senior management      |
| <input type="checkbox"/> "Walking the walk"                     | <input type="checkbox"/> Funding for training and resources required |



## Implementation Infrastructure

**How does your *organization* ensure that the processes important to the organization are persistently and habitually used and improved?**

Improving: Sustaining Habit and Persistence: II – Implementation Infrastructure (Staged View: ML 2)

### Probing Questions:

- How does your organization sustain the ability to consistently achieve goals and objectives efficiently and effectively?
- How does your organization establish the necessary infrastructure to ensure that processes are built, followed, sustained, and improved over time?
- How does your organization ensure that processes are persistent and habitual, even during times of stress or change?
- How does your organization ensure organizational and project processes are implemented rather than CMMI Practice Areas and practices?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- II 1.1 Perform processes that address the intent of the Level 1 practices.
- II 2.1 Provide sufficient resources, funding, and training for developing and performing processes.
- II 2.2 Develop and keep processes updated, and verify they are being followed.
- II 3.1 Use organizational processes and process assets to plan, manage, and perform the work.
- II 3.2 Evaluate the adherence to and effectiveness of the organizational processes.
- II 3.3 Contribute process-related information or process assets to the organization.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |   |
|---|---|
| <input type="checkbox"/> Process institutionalization | <input type="checkbox"/> Adequate resources                               |
| <input type="checkbox"/> Process training             | <input type="checkbox"/> Understanding the level of process effectiveness |
| <input type="checkbox"/> Continuous learning          | <input type="checkbox"/> Use of processes during times of stress          |



## Process Management

### How does your *organization* manage and implement the continuous improvement of processes and infrastructure?

Improving: Improving Performance: PCM – Process Management (Staged View: ML 3)

#### Probing Questions:

- How does your organization ensure that processes, infrastructure, and their improvement contribute to successfully meeting business objectives?
- How do improvement activities increase value for customers?
- How do strategic or regulatory changes drive improvement or changes to the process?
- How does your organization elicit improvement proposals?

#### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- PCM 1.1 Develop a support structure to provide process guidance, identify and fix process problems, and continuously improve processes.
- PCM 1.2 Appraise the current process implementation and identify strengths and weaknesses.
- PCM 1.3 Address improvement opportunities or process issues.
- PCM 2.1 Identify improvements to the processes and process assets.
- PCM 2.2 Develop, keep updated, and follow plans for implementing selected process improvements.
- PCM 3.1 Develop, keep updated, and use process improvement objectives traceable to the business objectives.
- PCM 3.2 Identify processes that are the largest contributors to meeting business objectives.
- PCM 3.3 Explore and evaluate potential new processes, techniques, methods, and tools to identify improvement opportunities.
- PCM 3.4 Provide support for implementing, deploying, and sustaining process improvements.
- PCM 3.5 Deploy organizational standard processes and process assets.
- PCM 3.6 Evaluate the effectiveness of deployed improvements in achieving process improvement objectives.
- PCM 4.1 Use statistical and other quantitative techniques to validate selected performance improvements against proposed improvement expectations, business objectives, or quality and process performance objectives.

#### Additional Topics:

Potential Sources of Risk or Opportunity:

- |  |   |
|--|---|
| <input type="checkbox"/> Aligning process improvement to goals | <input type="checkbox"/> Collaborative tools                              |
| <input type="checkbox"/> Determining improvement opportunities | <input type="checkbox"/> Working between projects and organizational orgs |
| <input type="checkbox"/> Plan improvement actions              | <input type="checkbox"/> Feedback mechanisms                              |
| <input type="checkbox"/> Implementing improvement actions      | <input type="checkbox"/> Continuous improvement focus                     |
| <input type="checkbox"/> Incorporating lessons learned         | <input type="checkbox"/> Deployment status across all programs            |



## Process Asset Development

**How does your *organization* develop and keep updated the process assets necessary to perform the work?**

Improving: Improving Performance: PAD – Process Asset Development (Staged View: ML 3)

### Probing Questions:

- How does your organization provide a capability to understand and repeat successful performance?
- How does your organization enable consistent process execution across projects?
- How does your organization share best practices and lessons learned?

### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- PAD 1.1 Develop process assets to perform the work.
- PAD 2.1 Determine what process assets will be needed to perform the work.
- PAD 2.2 Develop, buy, or reuse process assets.
- PAD 2.3 Make processes and assets available.
- PAD 3.1 Develop, keep updated, and follow a strategy for building and updating process assets.
- PAD 3.2 Develop, record, and keep updated a process architecture that describes the structure of the organization's processes and process assets.
- PAD 3.3 Develop, keep updated, and make processes and assets available for use.
- PAD 3.4 Develop, keep updated, and use tailoring criteria and guidelines for the set of standard processes and assets.
- PAD 3.5 Develop, keep updated, and make the organization's process asset library available for use.
- PAD 3.6 Develop, keep updated, and make work environment standards available for use.
- PAD 3.7 Develop, keep updated, and make organizational measurement and analysis standards available for use.

### Additional Topics:

Potential Sources of Risk or Opportunity:

- |   |   |
|---|---|
| <input type="checkbox"/> Definition of standard processes | <input type="checkbox"/> Organizational learning                    |
| <input type="checkbox"/> Access to organizational assets  | <input type="checkbox"/> Estimation process                         |
| <input type="checkbox"/> Tailoring instructions           | <input type="checkbox"/> Support for project level plan development |
| <input type="checkbox"/> Process architecture             | <input type="checkbox"/> Change process for standard processes      |
| <input type="checkbox"/> Mentoring                        | <input type="checkbox"/> Capturing project lessons learned          |



## Managing Performance and Measurement

### How does your *project, team, or organization* manage performance using measurement and analysis to achieve business objectives?

Improving: Improving Performance: MPM – Managing Performance & Measurement (Staged View: ML 3)

#### Probing Questions:

- How do you maximize business return on investment by focusing management and improvement efforts on cost, schedule, and quality performance?
- How do you ensure that benefits and business performance are the leading factors in driving performance and improvement?
- How do you use the results of measurement and analysis to manage and control performance at various work and business levels?

#### CMMI Practices:

Are there risks or opportunities associated with the way the project or team tries to:

- MPM 1.1 Collect measures and record performance.
- MPM 1.2 Identify and address performance issues.
- MPM 2.1 Derive and record measurement and performance objectives from selected business needs and objectives and keep them updated.
- MPM 2.2 Develop, keep updated, and use operational definitions for measures.
- MPM 2.3 Obtain specified measurement data according to the operational definitions.
- MPM 2.4 Analyze performance and measurement data according to the operational definitions.
- MPM 2.5 Store measurement data, measurement specifications, and analysis results according to the operational definitions.
- MPM 2.6 Take actions to address identified issues with meeting measurement and performance objectives.
- MPM 3.1 Develop, keep updated, and use organizational measurement and performance objectives traceable to business objectives.
- MPM 3.2 Follow organizational processes and standards to develop and use operational definitions for measures and keep them updated.
- MPM 3.3 Develop, keep updated, and follow a data quality process.
- MPM 3.4 Develop, keep updated, and use the organization's measurement repository.
- MPM 3.5 Analyze organizational performance using measurement and performance data to determine performance improvement needs.
- MPM 3.6 Periodically communicate performance results to the organization.
- MPM 4.1 Use statistical and other quantitative techniques to develop, keep updated, and communicate quality and process performance objectives that are traceable to business objectives.
- MPM 4.2 Select measures and analytic techniques to quantitatively manage performance to achieve quality and process performance objectives.
- MPM 4.3 Use statistical and other quantitative techniques to develop and analyze process performance baselines and keep them updated.
- MPM 4.4 Use statistical and other quantitative techniques to develop and analyze process performance models and keep them updated.
- MPM 4.5 Use statistical and other quantitative techniques to determine or predict achievement of quality and process performance objectives.

- MPM 5.1 Use statistical and other quantitative techniques to ensure that business objectives are aligned with business strategy and performance.
- MPM 5.2 Analyze performance data using statistical and other quantitative techniques to determine the organization's ability to satisfy selected business objectives and identify potential areas for performance improvement.
- MPM 5.3 Select and implement improvement proposals, based on the statistical and quantitative analysis of the expected effect of proposed improvements on meeting business, quality, and process performance objectives.

**Additional Topics:**

Potential Sources of Risk or Opportunity:

- |   |  |
|---|--|
| <input type="checkbox"/> Measurement plans and objectives           | <input type="checkbox"/> Data collection and storage procedures and/or tools |
| <input type="checkbox"/> Evidence of Adequate Resources and Tools   | <input type="checkbox"/> Analysis definitions, procedures and/or tools       |
| <input type="checkbox"/> People assigned responsibility and trained | <input type="checkbox"/> Analysis reports, draft reports, presentations      |
| <input type="checkbox"/> Measures databases                         | <input type="checkbox"/> Collected & derived measurement data sets           |
| <input type="checkbox"/> Results of data integrity tests            |  |