

Online Review Phases 1.6.1 Component Specification

All changes performed when synchronizing documentation with the version 1.6 of the source code of this component and fixed errors in the CS are marked with **purple**.

All changes made in the version 1.6.1 are marked with **blue**.

All new items in the version 1.6.1 are marked with **red**.

The Online Review application defines a set of phase types. This component provides the plug-ins to the Phase Management component, whose logic is to check if these phases can be executed. Extra logic to execute the phases is also provided.

The component provides a set of phase handler classes. They implement PhaseHandler interface to provide plug-in handlers for Phase Management component. Phase Management can load these handler classes from a configuration files. All handlers has constructor that can load settings from a configuration namespace.

Each handler provides two methods, that are canPerform () and perform(). canPerform() method determines if a phase can start or stop (**and if cannot, provides an explanation message, why**). While perform() executes some additional logic to start or stop a phase. These methods examine the input phase status to choose the action. If phase status is "Scheduled", they will check for "can start" or execute additional start logic. If phase status is "Open", they will check for "can stop" or execute additional stop logic.

The phase handlers in this component provide the logic to handle the following phases:

- Milestone Submission
- Milestone Screening
- Milestone Review
- Specification Submission
- Specification Review
- Registration
- Submission
- Screening
- Review
- Appeals
- Appeals Response
- Aggregation
- Aggregation Review
- Final Fix
- Final Review
- Approval
- Post-Mortem

The phase handlers can send email to a group of users associated to the timeline notification of the current project. User can configure to send email when starting the phase or when ending the phase, in both cases or not to send email at all.

This component provides some extra useful features such as:

- Adding some utility classes for getting value from lookup tables. They are phase status, phase type, resource role, submission status, submission type, project info type, upload status, upload type and notification type. These lookup tables are frequently used in phase related operations.
- Provide caching mechanism for lookup id. Because lookup id and lookup value pairs are not changed per database installation, caching them will minimize the database queries.

Version 1.1 changes:

- Ported component from ZUML to TCUML
- Updated all functionality added between versions 1.0 and 1.1 via bug fixes.
- Added a new phase "Post-Mortem" that is inserted when a registration, submission, screening, or appeals response phases result in zero applicable participants.
- Added routine in final review to insert an approval phase
- Added routine in approval to be able to launch another final-fix-final-review cycle.

Version 1.2 changes:

- Added capability to support different email template for different role (e.g. Submitter, Reviewer, Manager, etc). This includes default email templates for all roles.
- Support for more information in the email generated. The information could be specific to the phase. For instance, in appeal phase, the information about the submitters' scores could be given.

Version 1.3 changes:

- Changes from the Contest Dependency Automation assembly and End Of Project Analysis release assembly are integrated.
- The configuration for all phase handlers is revised to be more simple and powerful
- ManagerHelper class is updated by adding a new getter method for retrieving project detail url from configuration.

Version 1.4 changes:

- Added handlers for specification submission and specification review phases: SpecificationSubmissionPhaseHandler and SpecificationReviewPhaseHandler.
- Updated RegistrationPhaseHandler to make it check project dependencies only if Registration is the first phase of the project.
- Handlers are updated not to use ContestDependencyAutomation when inserting new phases to the project.
- ApprovalPhaseHandler was updated to end Approval phase, even when there are no submitted approval scorecards.

Version 1.6 changes:

- Added handlers for milestone submission, milestone screening and milestone review phases: MilestoneSubmissionPhaseHandler, MilestoneScreeningPhaseHandler and MilestoneReviewPhaseHandler.
- Added link to Studio contest in mail notifications sent for Studio competitions.
- Removed EJB calls in PostMortemPhaseHandler and replaced them with library calls
- Updated ReviewPhaseHandler to populate winners for Studio competitions

Version 1.6.1 changes:

- **canPerform() methods of all handlers were updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed.**

1.1 Design Patterns

Strategy pattern is used in phase handler classes. They implement the PhaseHandler interface to provide plug-in handlers for the Phase Management component.

1.2 Industry Standards

JDBC, XML, SQL

1.3 Required Algorithms

1.3.1 Loading configuration property [Common]

This is the logic of AbstractPhaseHandler constructor

Get the value of the 'ConnectionFactoryNS' property in the given namespace - required

Create a new instance of DBConnectionFactoryImpl using the above value and assign to the 'factory' field.

Get the value of the 'ManagerHelperNamespace' property in the given namespace - optional

If the property does not exist, create the ManagerHelper field using default constructor

Else, create the ManagerHelper field using the configured namespace.

Get the value of the 'ConnectionName' property - optional. Assign its value to 'connectionName' field if it exists.

Load the schemes defined as child property of 'Schemes', each schemes child property contains a list of roleName to be mapped to this schemes, regex '*' can be used to match all the resource roles in database.

Retrieve the full resource roles from database by calling managerHelper.getResourceManager().getAllResourceRoles().

For each scheme in schemes list:

For xx in {start, end}.

Create new EmailOptions object

Read the configuration values [\$scheme]/xxPhaseEmail/ into the EmailOptions object

Add it to xxPhaseEmailOptions map for each role names related to the scheme. If the role name contains '*', map the created email options to every role name.

Get the value of the 'ProjectDetailsURL' property by calling ManagerHelper#getProjectDetailsBaseUrl() method.

Throw ConfigurationException if any required field is missing or empty.

1.3.2 Common logic for accessing database methods [Common]

To satisfy the requirement of connection cannot be cached. Methods that access database must create connection at the beginning and close connection when finished.

With methods that update database, transaction logic should be provided as below to ensure data consistence.

Create connection using the 'factory' instance and the configured DB connection name (connectionName).

If connectionName is null, create the default connection.

Set the connection's auto commit to false.

Do create/update.

If error occurred, call rollback, and then throw PhaseHandlingException that wrap the error.

Call commit if everything is fine.

Close the connection in finally block.

1.3.3 Email sending when changing phase [Common]

This method is used in every phase handler class, perform() method to send email to the related users.

Do not send any e-mails for phases whose duration is zero or its dates have not yet been set.

```

First check value of 'sendStartPhaseEmail' and 'sendEndPhaseEmail'.
    If phase status is 'Scheduled' and sendStartPhaseEmail=true --> Initialize and
send start email
    If phase status is 'Open' and sendEndPhaseEmail=true --> Initialize and send
end email
    Otherwise, do nothing

```

Use DocumentGenerator

```

// instantiate the Document Generator
DocumentGenerator instance = new DocumentGenerator();
instance.setDefaultTemplateSource(new FileTemplateSource());

```

```

Project project =
managerHelper.getProjectManager().getProject(phase.getProject().getId());

```

Get email addresses to send:

```

    Use Resource Management to get all notification ids for a project. The
notification ids here are
    the external id of users that need to be notified when a phase change.
    Lookup project info type id for "Timeline Notification" use
NotificationTypeLookupUtility class. (typeId)
    long[] externalIds =
managerHelper.getResourceManager().getNotifications(phase.getProject().getId(),
typeId);

// get projectId
long projectId = phase.getProject().getId();

// the list of resource where the email is to be sent
List resources = new ArrayList();

// populate the list
ResourceRole[] roles = resourceManager.getAllResourceRoles()
For role in roles
    // find set of resources with this role
    Filter resourceRoleFilter =
        ResourceRoleFilterBuilder.createResourceRoleIdFilter(role.getId());
    Filter projectIdFilter =
        ResourceFilterBuilder.createProjectIdFilter(projectId);
    Filter fullFilter = SearchBundle.buildAndFilter(resourceRoleFilter,
        projectIdFilter);
    Resource[] cur=getResourceManager().searchResources(fullFilter);
    For each resource in cur
        // is this resource needs notification?
        long externalId = Long.parseLong(resource.getProperty("External
        Reference ID"));
        if (externalId is included in externalIds)
            also, compare if the resource in this role has higher priority
            than other roles
            resources.add(resource);

// process each resource
For each res in resources
    // Use Resource Manager to get the role of the user
    Resource res = managerHelper.getResourceManager().getResource(id);
    ResourceRole role = res.getResourceRole();
    String roleName = role.getName();

    // (xx can be start or end)
    EmailOptions options = xxPhaseEmailOptions.get("default");

    EmailOptions roleOptions = xxPhaseEmailOptions.get(roleName);

```

```

If (roleOptions is not null)
    For each not-null property of roleOptions
        set the property of options object to that of roleOptions
if (roleOptions.isSend() is false or options.isSend is false)
    continue;

//The idea is copy the setting from default-options and if any fields in
//the role-options is not null, using the role-options's setting, also, if
//the role-options is null, using the default one

//to send email now
String name = options.getTemplateName();
Template template = instance.getTemplate(name);

// for each external user, set field values
TemplateFields root = instance.getFields(template);
Node[] nodes = root.getNodes();

for (int i = 0; i < nodes.length; i++) {
    if (nodes[i] instanceof Field) {
        Field field = nodes[i];
        // Set field value using field.setValue() method,
        // base on field.getName()
    }
    Else if (nodes[i] instanceof Loop) {
        List loopItems = (List) values.get(loop.getLoopElement());
        if (loopItems == null) {
            throw new PhaseHandlingException("For loop : " +
                loop.getLoopElement() + ", the value in look up maps should not be
                null.");
        }
        for (int t = 0 ; t < loopItems.size(); t++) {
            NodeList item = loop.insertLoopItem(t);
            setNodes(item.getNodes(), user, project, phase, (Map<String,
                Object>) loopItems.get(t), bStart);
        }
    }
    Else if (nodes[i] instanceof Condition) {
        Condition condition = ((Condition) nodes[i]);
        if (values.containsKey(condition.getName())) {
            condition.setValue(values.get(condition.getName()).toString());
        }
        setNodes(condition.getSubNodes().getNodes(), user, project, phase,
            values, bStart);
    }
}

String emailContent = instance.applyTemplate(root);

Send email
TCSEmailMessage message = new TCSEmailMessage();
message.setSubject(options.getSubject() + ": " + projectName);
message.setBody(emailContent);
message.setFromAddress(options.getFrom());
message.setToAddress(user.getEmail());
EmailEngine.send(message);

```

The map between field name and value to set:

```

PROJECT_NAME -> project's name
PROJECT_VERSION --> project's version
PROJECT_CATEGORY --> project's category
PHASE_TYPE --> Phase.getPhaseType().getName()
PHASE_OPERATION --> "start" or "end" depends on the input phase status.

```

```

        If status is "Scheduled" -> "start"
        If status is "Open" -> "end"
    PHASE_TIMESTAMP --> The time of performing the phase
    USER_FIRST_NAME --> ExternalUser.getFirstName()
    USER_LAST_NAME --> ExternalUser.getLastName()
    USER_HANDLE --> ExternalUser.getHandler()
    OR_LINK --> "<![CDATA[" + projectDetailsBaseURL + project.getId() + "]]>"
    STUDIO_LINK --> "<![CDATA[" + studioProjectDetailsBaseURL +
project.getId()+"]]>"
    For each other value, look up values Map argument with key = field name.

```

Those field names are constants. They are and used in a template of DocumentGenerator to generate documents.

1.3.4 *Using various related manager components [Common]*

This component uses these components for searching/updating database:

- Deliverable Management: UploadManager interface. Default implementation is PersistenceUploadManager class and default persistence class is SqlUploadPersistence.
- Resource Management: ResourceManager interface. Default implementation is PersistenceResourceManager class and default persistence class is SqlResourcePersistence.
- Review Management: ReviewManager interface. Default implementation is DefaultReviewManager class.
- Scorecard Management: ScorecardManager interface. Default implementation is ScorecardManagerImpl class.
- Project Management: ProjectManager and ProjectLinkManager interfaces. Default implementations are ProjectManagerImpl and ProjectLinkManagerImpl classes.

Phase Management : PhaseManager interface. Default implementation is DefaultPhaseManager class.

User Project Data Store : The UserRetrieval interface are used from this component. Default implementations used are DBUserRetrieval.

Review Score Aggregator : The ReviewScoreAggregator class is used.

These default implementations of these interfaces require initialization of DBConnectionFactory, SearchBundle and IDGenerator components. These components should be properly configured. See their component specifications for configuration information.

All of those interface provide search() method for searching. search() method receives a parameter of type Filter, a class of Search Builder component.

Filter can be created by some utility methods provided in those management components. Filter can be created for various search conditions and can be combined using AND/OR/NOT.

Some phase handler's perform method need to update database. In the update methods, operator parameter is required. Simply pass the "operator" parameter to it.

1.3.5 *Loading manager instance use reflection [Common]*

ManagerHelper class loads the manager from the settings in a configuration namespace. The properties are detailed in section "3.2 Configuration Parameters". Their values are used to create manager instances use reflection. The phase handler classes keep this class as a field to use when needed.

Following is details:

- For ScorecardManager, ReviewManager, ProjectManager, ProjectLinkManager, ReviewScoreAggregator, PhaseManager, UserRetrieval:
 - If "Namespace" property does not present, default constructor will be used.
 - Else, use the namespace to pass to the constructor.
- For ResourceManager and UploadManager, the constructor parameters are SearchBundle and IDGenerator instances.
 - Create SearchBundleManager instance.
 - Use SearchBundleManager to create SearchBundle instances from the configured names.
 - Use IDGeneratorFactory to create IDGenerator instances from the configured names.
- For UserTermsOfUse and ProjectRoleTermsOfUse
 - Default constructor for passed namespace will be used to create object.

1.3.6 *Lookup values [Common]*

Logic for lookUpId() methods in the utility classes:

```
- Look at 'cachedPairs' map to see if parameter 'value' exists as a key
  If yes
    Return the cached id
  Else:
    Query database for lookup id base the given value
    Save the pair to 'cachedPairs' map. Key is "lookup value", value is
"lookup id"
    Return the id
  End If
```

Select commands (? will be the 'value' parameter)

```
For SubmissionStatusLookupUtility
  SELECT submission_status_id FROM submission_status_lu WHERE name = ?
For SubmissionTypeLookupUtility
  SELECT submission_type_id FROM submission_type_lu WHERE name = ?
For ResourceRoleLookupUtility
  SELECT resource_role_id FROM resource_role_lu WHERE name = ?
For PhaseTypeLookupUtility
  SELECT phase_type_id FROM phase_type_lu WHERE name = ?
For PhaseStatusLookupUtility
  SELECT phase_status_id FROM phase_status_lu WHERE name = ?
For ProjectInfoTypeLookupUtility
  SELECT project_info_type_id FROM project_info_type_lu WHERE name = ?
For UploadStatusLookupUtility
  SELECT upload_status_id FROM upload_status_lu WHERE name = ?
For UploadTypeLookupUtility
  SELECT upload_type_id FROM upload_type_lu WHERE name = ?
```

1.3.7 *Check if a phase start time is reached [Routine]*

Corresponds to PhasesHelper#reachedPhaseStartTime() method.

Call phase.calcStartDate() method to get the date time when the given phase can start.

If phase start time is null, return true.

If current date time is later than or equal to phase start time, return true.

1.3.8 *Check if a phase end time is reached [Routine]*

Corresponds to PhasesHelper#reachedPhaseEndTime() method.

Call phase.calcEndDate() method to get the date time when the given phase can end.

If current date time is later than or equal to phase end time, return true.

1.3.9 *Check if all dependencies of a phase have correct status [Routine]:*

Corresponds to PhasesHelper#arePhaseDependenciesMet() method. Starting from the version 1.6.1 this routine not only returns true/false, but additionally provides an explanation message in case if at least one of dependencies has invalid status.

```
Get an array of phase's dependencies
dependencies[]=phase.getAllDependencies()

Return OperationCheckResult.SUCCESS if dependencies.length = 0

For each dependency
    Get its phase using getDependency() method (subPhase)
    Get phase status name using subPhase.getPhaseStatus().getName()
    If phase has to be started
        If dependency.isDependencyStart() and dependency.isDependentStart()
            If the subPhase status name is not "Open",
                return new OperationCheckResult("Dependency " +
subPhase.getPhaseType().getName() + " phase is not yet started")
        If not dependency.isDependencyStart() and dependency.isDependentStart()
            If the subPhase status name is not "Closed",
                return new OperationCheckResult("Dependency " +
subPhase.getPhaseType().getName() + " phase is not yet ended")
    Else
        If dependency.isDependencyStart() and not dependency.isDependentStart()
            If the subPhase status name is not "Open",
                return new OperationCheckResult("Dependency " +
subPhase.getPhaseType().getName() + " phase is not yet started")
        If not dependency.isDependencyStart() and not dependency.isDependentStart()
            If the subPhase status name is not "Closed",
                return new OperationCheckResult("Dependency " +
subPhase.getPhaseType().getName() + " phase is not yet ended")
End For

Return OperationCheckResult.SUCCESS
```

1.3.10 *Locating phases [Routine]*

Corresponds to PhasesHelper#locatePhase() method.

In some methods, from the current phase we need to find a backward phase or a forward phase. For example, from Aggregation phase, we may need to go back and find the nearest Review phase. Or from Submission, we may need to go forward and find the nearest Screening phase.

Get the current project

```
currentPhase.getProject() (project)
```

Get all phases belong to the project. Note that the phases are sorted

```
Using project.getAllPhases() (phases[])
```

Find the index of the currentPhase in phases[] (index)

```
Using currentPhase.getId() and compare with instances in phases[]
```

To find a nearest backward phase of a type, start from index-1 and decreasing

To find a nearest forward phase of a type, start from index+1 and increasing

If cannot find the nearest backward/forward case of the given type, throw PhaseHandlingException

1.3.11 *Search resource based on resource role names and phase id [Routine]*

Corresponds to PhasesHelper#searchResourcesForRoleNames() method.

Input:

- resourceRoleNames(String[]): An array of resource role names to search
Resource is people who assigned for a phase. Resource role can be "Submitter", "Screener", "Reviewer", "Aggregator", etc.
- phaseId: The phase id to search for resource

Output:

An array of Resource instance (resources[])

Lookup resource ids for the resource role names use "ResourceRoleLookupUtility" class.

Search using Resource Management

```
Create filter with resource_role_id IN [roleIds] AND phase id = phase.getId()
Resource[] resources = ResourceManager.search(filter)
```

1.3.12 Search all reviews for a phase based on resource roles [Routine]

Corresponds to PhasesHelper#searchReviewsForResourceRoles() method.

Input:

- phaseId(long): Id of the phase to search for reviews
- resourceRoleNames(String[]): The name of the reviewer roles. For specification review it is "Specification Reviewer". For screening review, the names can be "Primary Screener" and "Screener". For review, it is "Reviewer", "Accuracy Reviewer", "Failure Reviewer" and "Stress Reviewer". For aggregation, it is "Aggregator". For approval, it is "Approver". For post-mortem, it is "Post-mortem Reviewer"

Output:

- reviews[]: An array of reviews of some type (specification review scorecard, screening review scorecard, main review scorecard, aggregation review scorecard, post-mortem scorecard or approval scorecard)

Search the reviewIds using Resource Management:

```
Search for resources with resource_role_name IN resourceRoleNames[] AND
phase_id=phaseId
Resource[] reviewers = ResourceManager.search(filter)
Create an array of reviewerIds from reviewers[] array using reviewer.getId()
Use Review Management to search for review with reviewer id IN [reviewerIds
array]
Review[] reviews = ReviewManager.search(filter)
```

1.3.13 Check screening type [Routine]

Corresponds to PhasesHelper#isScreeningManual() method.

Get phase attribute "Manual Screening":

```
String manualScreening = phase.getAttribute("Manual Screening")
If the return value is "Yes" screening type is manual, otherwise it is
automatic.
```

1.3.14 Get the scorecard minimum score using a review [Routine]

Corresponds to PhasesHelper#getScorecardMinimumScore() method.

```
Get scorecardId from one the review instance: scorecardId = review.getScorecard()
Use Scorecard Management to get the Scorecard instance:
scorecard = ScorecardManager.getScorecard(scorecardId)
minScore = scorecard.getMinScore()
```

1.3.15 Get the winning submitter [Routine]

Corresponds to PhasesHelper#getWinningSubmitter() method.

Get project with project manager:

```

    project = projectManager.getProject(projectId)
Get winner ID from the project property
    winnerId = (String) project.getProperty("Winner External Reference ID")
If winnerId is null then return null
Lookup "Submitter" role ID using ResourceRoleLookupUtility (submitterRoleId)
Use ResourceManager to search for resource with
    resource_role_id = submitterRoleId
    projectId = <value of project id routine parameter>
    extension_property_name = "External Reference ID"
    extension_property_value = winnerId
Return the first found resource or null if found nothing

```

1.3.16 *Get worksheet [Routine]*

Corresponds to PhasesHelper#getWorksheet() method. It accepts role name and phase ID. This method is used for retrieving Aggregation and Final Review worksheets.

```

Use "Search all reviews for a phase based on resource roles" routine with the
given aggregation phase ID and role
If no reviews found, return null
If more than one review is found, throw PhaseHandlingException
Return the found review

```

1.3.17 *Search all ScreeningTasks for the project [Routine]*

This routine is removed in the version 1.6.1.

1.3.18 *Search all active submissions with specific submission type for the project [Routine]*

```

Corresponds to PhasesHelper#searchActiveSubmissions() method. Parameter
submissionTypeName:String was added to the method.
    Lookup submission status id for "Active" status using
    SubmissionStatusLookupUtility class (activeStatusId)
    Lookup submission type ID by submissionTypeName using
    SubmissionTypeLookupUtility:
        submissionTypeId = SubmissionTypeLookupUtility.lookupId(connection,
        submissionTypeName)
    Use Deliverable Management to search for submission with: ProjectId =
    phase.getProject().getId()
    AND submission status id = activeStatusId
    AND submission type ID = submissionTypeId (use SubmissionFilterBuilder.
    createSubmissionTypeIdFilter(submissionTypeId) filter)

```

1.3.19 *Insert Post-Mortem Phase*

```

Corresponds to PhasesHelper#insertPostMortemPhase() method.
Get current project by phase.getProject()
    (currentPrj)
Get "Post-Mortem Required" property of the project:
    currentPrj.getProperty("Post-Mortem Required") (postMortemRequired)
If postMortemRequired is not equal to "true" then return (no need to insert a
post-mortem phase)
Get current project phases
Phase[] phases = currentPrj.getAllPhases(). The phases are already sorted in the
right order
If phase with type "Post-Mortem" already exists in phases, return.
Find the current phase in the array using phase.getId() (currentPhase)
Lookup phase type with name "Post-Mortem"
Lookup phase status with name "Scheduled"
Create a Phase instance of current project with "Scheduled" status and type "Post-
Mortem" respectively. Read the length of this phase from the configuration.
Set "Reviewer Number" and "Scorecard ID" attributes of the created phase (read
these values from the configuration)

```

Insert the new phase into "phases" array, after the currentPhase.
Update the phases in currentPrj instance
 Using currentPrj.addPhase() methods
Update the phases into persistence using Phase Management component
 Using PhaseManager.updatePhases()

1.3.20 *Insert Approval Phase*

Corresponds to PhasesHelper#insertApprovalPhase() method.

Get current project by phase.getProject() (currentPrj)
Get current project phases
 Phase[] phases = currentPrj.getAllPhases(). The phases are already sorted in the right order
Find the current phase in the array using phase.getId() (currentPhase)
Lookup phase type with name "Approval"
Lookup phase status with name "Scheduled"
Create a Phase instance for current project, "Scheduled" status, type "Approval" respectively. Read the length of this phase from the configuration.
Set "Reviewer Number" and "Scorecard ID" attributes of the created phase (take values from the previous approval phase or read from the configuration if it's the first approval phase in the project)
Insert the new phase into "phases" array, after the currentPhase.
Update the phases in currentPrj instance
 Using currentPrj.addPhase() method
Update the phases into persistence using Phase Management component
 Using PhaseManager.updatePhases()

1.3.21 *Insert final fix/review cycle*

Corresponds to PhasesHelper#insertFinalFixAndFinalReview() method.

Get current project by phase.getProject() (currentPrj)
Get current project phases: Phase[] phases = currentPrj.getAllPhases(). The phases are already sorted in the right order
Find the current Final Review phase in the array
 use phase.getId() (currentPhase)
Lookup phase types with names "Final Fix" and "Final Review"
Lookup phase status with name "Scheduled"
Create two Phase instances of Current project, "Scheduled" status, types "Final Fix" and "Final Review" respectively
Insert the two new phase into "phases" array, after the currentPhase.
Update the phases in currentPrj instance Using currentPrj.addPhase() method
Update the phases into persistence with Phase Management component using PhaseManager.updatePhases()

1.3.22 *Insert specification submission/specification review cycle*

Corresponds to PhasesHelper#insertSpecSubmissionAndSpecReview() method. *(For developers: this new method is very similar to PhasesHelper#insertFinalFixAndFinalReview(). Please use it as a reference).*

Get current project by phase.getProject() (currentPrj)
Get current project phases: Phase[] phases = currentPrj.getAllPhases(). The phases are already sorted in the right order
Find the current "Specification Review" phase in the array
 use phase.getId() (currentPhase)
Lookup phase types with names "Specification Submission" and "Specification Review"
Lookup phase status with name "Scheduled"
Create two Phase instances of Current project, "Scheduled" status, types "Specification Submission" and "Specification Review" respectively

Insert the two new phase into "phases" array, after the currentPhase.
 Update the phases in currentPrj instance Using currentPrj.addPhase() method
 Update the phases into persistence with Phase Management component using
 PhaseManager.updatePhases()

1.3.23 Check if the given phase is the first phase in the project [Routine]

Corresponds to PhasesHelper#isFirstPhase() method.

Input: phase:Phase - the phase to be checked
 Get all phases for the project:
 Phase[] phases = phase.getProject().getAllPhases()
 Get index of the input phase in phases array. (phaseIndex)
 While phaseIndex > 0 and phases[phaseIndex-1].calcStartDate() equals to
 phases[phaseIndex].calcStartDate() do:
 phaseIndex--;
 If phaseIndex == 0 then this is the first phase in the project

1.3.24 Check if all parent projects are completed [Routine]

Corresponds to PhasesHelper#areParentProjectsCompleted() method.

Input: projectId:long
 ProjectLink[] links=projectLinkManager.getDestProjectLinks(projectId);
 For each link with type.isAllowOverlap()==false
 Get parent project: parentProject = link.getDestProject();
 If parentProject.getProjectStatus().getId() != 1 return false (not active)
 phasesProject = phaseManager.getPhases(parentProject.getId());
 For each phase from phasesProject.getAllPhases()
 If phase status ID != 3 (not closed) return false
 return true

1.3.25 Extend project start time by the given time [Routine]

This routine was removed from RegistrationPhaseHandler in the version 1.4.

1.3.26 Specification Submission Phase Handler

canPerform() - Can start (checkPhaseStatus() returned true)

Specification Submission phase can start as soon as:

- The dependencies are met
- Phase start date/time is reached (if specified)
- This is NOT the first phase in the project OR all parent projects are completed

If all conditions are met this method must return OperationCheckResult.SUCCESS.
 Otherwise a new OperationCheckResult instance with one of the following
 explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)
"Not all parent projects are completed"

Check if the dependencies are met

Use the routine "Check if all dependencies of a phase have correct status".

If phase.calcStartDate() is not null

Use the routine "Check if a phase start time is reached".

Check if the current phase is the first phase in the project

Use "Check if the given phase is the first phase in the project" routine

Checking if all parent projects are completed:

Use "Check if all parent projects are completed" routine

canPerform() - Can stop (checkPhaseStatus() returned false)

Specification Submission phase can stop when:

- The dependencies are met
- If one active submission with "Specification Submission" type exists

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Specification submission doesn't exist"

The dependencies are met

Use the routine **"Check if all dependencies of a phase have correct status"**.

Check if one specification submission exists

Use "Search all active submissions with specific submission type for the project" routine with submission type = "Specification Submission" to get `submissions[]`.

If `submissions` array is empty, return false

If `submissions` array contains more than 1 element, throw `PhaseHandlingException`

Return true

perform() - Start (checkPhaseStatus() returned true)

Call `sendEmail(phase)` method of `AbstractPhaseHandler`

perform() - Stop (checkPhaseStatus() returned false)

Call `sendEmail(phase)` method of `AbstractPhaseHandler`

1.3.27 Specification Review Phase Handler

canPerform() - Can start

Specification Review phase can start as soon as:

- The dependencies are met
- Phase start date/time is reached (if specified)
- If one active submission with "Specification Submission" type exists

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)
"Specification submission doesn't exist"

Check if the dependencies are met

Use the routine **"Check if all dependencies of a phase have correct status"**.

If `phase.calcStartDate()` is not null

Use the routine **"Check if a phase start time is reached"**.

Check if one specification submission exists

Use the approach described for **"Can stop"** in the previous section of CS

canPerform() - Can stop

Specification Review phase can stop when:

- The dependencies are met
- The specification submission exists
- The specification review is done by Specification Reviewer

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Specification submission doesn't exist"
"Specification review is not yet committed"

The dependencies are met

Use the routine **"Check if all dependencies of a phase have correct status"**.

Check the specification review is done by Specification Reviewer

Use **"Search all active submissions with specific submission type for the project"** routine with `submission type = "Specification Submission"` to get `submissions[]`.

If `submissions` array is empty, return false

If `submissions` array contains more than 1 element, throw `PhaseHandlingException`

`submission = submissions[0];`

Search the Specification Review worksheet using the "Search all reviews for a phase based on resource roles" routine with `phase_id = phase.getId()`, `resource_role_name = "Specification Reviewer"` and `submission_id = submission.getId()`. (`reviews[]`)

If `reviews` array is empty, return false

If `reviews` array contains more than 1 element, throw `PhaseHandlingException`

`review = reviews[0];`

If `review.isCommitted()`, the specification review is done

perform() - Start

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

- supply the map with the following:
- `N_SPECIFICATION_REVIEWERS`: the number of specification reviewers assigned

To get `N_SPECIFICATION_REVIEWERS`:

Use "Search resource based on resource role name and phase id" with `ResourceRoleName: "Specification Reviewer"` and `phaseId:(phase.getId())`

perform() - Stop

When Specification Review phase is stopping, if the specification review is rejected, another specification submission/specification review cycle is inserted and status of the specification submission is changed to "Failed Review".

Find out if the specification review is rejected

Use **"Search all active submissions with specific submission type for the project"** routine with `submission type = "Specification Submission"` to get `submissions[]`.

If `submissions.length != 1`, throw `PhaseHandlingException`

`submission = submissions[0];`

Search the Specification Review worksheet using the "Search all reviews for a phase based on resource roles" routine with `phase_id = phase.getId()`, `resource_role_name = "Specification Reviewer"` and `submission_id = submission.getId()`. (`reviews[]`)

If `reviews.length != 1`, throw `PhaseHandlingException`

`review = reviews[0];`

If not `review.isCommitted()`, throw `PhaseHandlingException`

Get all review comments

`review.getAllComments()` (`comments[]`)

Search the result array and find the comment with

```

        comment.getCommentType().getName()="Specification Review Comment"
(srComment)
    Check if the comment is approve or reject
    If srComment.getExtraInfo()=="Rejected" then the specification review is
    rejected.
    Else if it's not "Approved" or "Accepted", throw PhaseHandlingException

If specification review was rejected, update specification submission status
    Lookup submission status id for "Failed Review" status using
    SubmissionStatusLookupUtility class (failedReviewStatusId)
    Set "Failed Review" status to submission:
        submission.setSubmissionStatus(failedReviewStatusId)
    Update submission in persistence:
        getManagerHelper().getUploadManager().updateSubmission(submission,
operator)

Insert another specification submission/specification review cycle (For
developers: FinalReviewPhaseHandler#checkFinalReview method performs very similar
operations, please use it as a reference, but don't use
ContestDependencyAutomation)
    Use the routine "Insert specification submission/specification review cycle"
    Search for old "Specification Reviewer" resource (associated with the current
phase). Clone it and associate a cloned resource with the new "Specification
Review" phase. Please use PhasesHelper#createAggregatorOrFinalReviewer as a
reference to implement this step.
    Persist cloned resource with ResourceManager#updateResource().

Call sendEmail(phase,map) method of AbstractPhaseHandler
- supply the map with the following:
- RESULT: The result of specification review: rejected/approved

To get RESULT: See "Find out if the specification review is rejected" step above.

```

1.3.28 Registration Phase Handler

canPerform() - Can start

Registration phase can start as soon as:

- The dependencies are met
- Phase start date/time is reached (if specified)
- This is NOT the first phase in the project OR all parent projects are completed

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)
"Not all parent projects are completed"

Check if the dependencies are met
 Use the routine **"Check if all dependencies of a phase have correct status"**.

If `phase.calcStartDate()` is not null
 Use the routine **"Check if a phase start time is reached"**.

Check if the current phase is the first phase in the project
 Use **"Check if the given phase is the first phase in the project"** routine

Checking if all parent projects are completed:
 Use **"Check if all parent projects are completed"** routine

canPerform() - Can stop

Registration phase can stop when all these conditions met:

- The dependencies are met
- The period has passed
- The number of registrations meets the required number or there are no registrations.

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase end time is not yet reached"

"Not enough registrants"

The dependencies are met

Use the routine **"Check if all dependencies of a phase have correct status"**.

The period has passed

Use the "Check if a phase end time is reached" routine.

For "The number of registrations meets the required number or there are no registrations":

Get the number of required registrations using the "Registration Number" phase attribute:

String regNumber = phase.getAttribute("Registration Number")

Use Resource Management to search for resources with

Role equals "Submitter"

Project id equals phase.getProject().getId()

Compare the number of resource returned from the search with "regNumber" to see if the condition met. Condition is also met when the number of registrations is equal to 0.

perform() - Start

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

perform() - Stop

If there are no registrants, use the routine **"Insert Post-Mortem phase"**.

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

- supply the map with the following:

- `N_REGISTRANTS`: the number of registrants

- `REGISTRANT`: a list containing 1 element for each registrant. Each registrant is represented as a map with the following keys: `REGISTRANT_HANDLE`, `REGISTRANT_RELIABILITY`, `REGISTRANT_RATING`

To get `N_REGISTRANTS` and `REGISTRANT`:

Use Resource Management to search for resources with

Role equals "Submitter"

Project id equals phase.getProject().getId()

1.3.29 Submission Phase Handler

canPerform() - Can start

- The dependencies are met

- Check phase start date time if exist

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase start time is not yet reached" (created in subroutine)

Check the dependencies are met

Use the routine "Check if a phase start time is reached".

If phase.calcStartDate() is not null

Submission phase can start as soon as the start time is reached

canPerform() - Can stop

Submission phase can stop when all of these conditions met:

- The dependencies are met
- The phase end time is reached

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase end time is not yet reached"

The dependencies are met

Use the routine "Check if all dependencies of a phase have correct status".

The phase end time is reached

Use the "Check if a phase end time is reached" routine.

perform() - Start

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

perform() - Stop

If there are no submissions with "Contest Submission" type, use the routine **"Insert Post-Mortem phase"**.

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

- supply the map with the following:
- `N_SUBMITTERS` : the number of submitters
- `SUBMITTER`: a list containing 1 element for each submitter. Each submitter is represented as a map with the following keys: `SUBMITTER_HANDLE`, `SUBMITTER_RELIABILITY`, `SUBMITTER_RATING`

To get `SUBMITTER` array:

- Use Deliverable Management to search for submission with: `ProjectId = phase.getProject().getId()` AND submission type ID = looked up "Contest Submission" type ID
- For each Submission returned, get the owner: `submission.getUpload().getOwner()`
- Use Resource Management to get submitter (submitter is a resource):
 `submitter = ResourceManager.getResource(submitterId)`

1.3.30 Screening Phase Handler

canPerform() - Can start

Screening can start as soon as the dependencies are met.

Use the routine "Check if all dependencies of a phase have correct status".

If phase.calcStartDate() is not null

Use the routine "Check if a phase start time is reached".

Also the number of active submissions with "Contest Submission" type must be greater than 0.

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase start time is not yet reached" (created in subroutine)

"Contest has no submissions"

canPerform() - Can stop

Screening can stop when:

- The dependencies are met
- If it's primary screening mode, all submissions that passed auto-screening have one screening scorecard committed.
- If it's individual screening mode, the submission that passed auto-screening has one screening scorecard committed.

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Not all primary screening scorecards are committed (see submission with ID=XXX)"

"Individual screening scorecard is not committed"

The dependencies are met

Use the routine **"Check if all dependencies of a phase have correct status"**.

Determine the screening mode (Primary or individual):

Lookup resource role id for **"Primary Screener"** and **"Screener"** using `ResourceRoleLookupUtility` (`primaryScreenerId` and `screenerId`)

Use Resource Management to search for resource with the resource role id = **"primaryScreenerId"** and **"screenerId"**

If search for **"Primary Screener"** returns at least one row, the screening mode is primary

If search for **"Screener"** returns at least one row, the screening mode is individual.

If it's primary screening mode, all submissions that passed auto-screening have one screening scorecard committed.

Search all screening scorecard for the current phase:

Use the **"Search all reviews for a phase base on resource roles"** routine.

Input:

- `phaseId=phase.getId()` (current phase id)
- `resourceRoleName="Primary Screener"`

Output:

- `screenReviews[]`

Search all active submissions with **"Contest Submission"** type for current project using **"Search all active submissions with specific submission type for the project"** routine (`submissions[]`)

Number of reviews must be equal to the number of submissions.

Check if every submission has an associated screening scorecard

For each submission

Look for its matching scorecard using

`submission.getId()==screenReview.getSubmission()`

End For

Check if all of the screening scorecards are committed

Walk the `screenReviews[]` and check `screenReview.isCommitted()`

If it's individual screening mode, the submission that passed auto-screening has one screening scorecard committed.

Search the submission for the current individual screening phase

Search the submitter for this phase

Use the **"Search resource based on resource role names and phase id"** routine.

Input:

- resourceRoleNames: "Submitter"
- phaseId: current phase id (phase.getId())

Output:

- resources[]

If resources[].length <> 1, throw PhaseHandlingException for inconsistency data.

submitter = resource[0]

Search the submission base on the submitter (submissions[])

Use Deliverable Management to search for submission with: ProjectId = phase.getProject().getId()

AND resource Id = submitter.getId()

AND submission type ID = <looked up ID for "Contest Submission">

If submissions[].length <> 1, throw PhaseHandlingException for inconsistency data.

submission=submissions[0]

Use the **"Search all reviews for a phase base on resource roles"** routine.

Input:

- phaseId=phase.getId() (current phase id)
- resourceRoleName="Screener"

Output:

- screenReviews[]

For individual screening mode, each phase will be associated with one submission. So if screenReviews[].length <> 1, throw PhaseHandlingException for inconsistency data.

screenReview=screenReviews[0]

Check if the screening review is associated with the submission

Use submission.getId()==screenReview.getSubmission()

Check if the screening scorecards are committed

Check screenReview.isCommitted()

perform() - Start

Call sendEmail(phase,map) method of AbstractPhaseHandler

- supply the map with the following:
- NEED_PRIMARY_SCREENER : set to 1 if primary screener is not available, 0 otherwise
- SUBMITTER: a list containing 1 element for each submitter. Each submitter is represented as a map with following key SUBMITTER_HANDLE, SUBMITTER_RELIABILITY, SUBMITTER_RATING

To get NEED_PRIMARY_SCREENER:

- Use Resource Management to search for resource with the resource role id = "primaryScreenerId" and "screenerId"
- If this is null then NEED_PRIMARY_SCREENER is set to 1
-

To get SUBMITTER array:

- Use Deliverable Management to search for submission with: ProjectId = phase.getProject().getId() AND submission type = "Contest Submission"
- - For each Submission returned, get the owner: submission.getUpload().getOwner()

- - Use Resource Management to get submitter (submitter is a resource):
submitter = ResourceManager.getResource(submitterId)

perform() - Stop

When screening is stopping:

- All submissions with failed screening scorecard scores should be set to the status "Failed Screening"
- Screening score for the all submissions will be saved to the submitters' resource properties named "Screening Score".

Search all submissions with "Contest Submission" type for current project using "Search all active submissions with specific submission type for the project" routine (submissions[]):

Search all screening scorecard for the current phase:

Use the "Search all reviews for a phase base on resource roles" routine.

Input:

- phaseId=phase.getId() (current phase id)
- resourceRoleNames="PrimaryScreener", "Screener"

Output:

- screenReviews[]

Throw PhaseHandlingException if the number of submissions is not equal to the number of screening scorecards.

Get the screening minimum score:

Use the "**Get the scorecard minimum score using a review**" routine.

(With the first instance in screenReviews[])

For each submission

Find the matching screening review using submission.getId() =
screeningReview.getSubmission()
Get submission's screening score: screeningScore =
screeningReview.getScore()

Store the screening score for the submission

Set screening score:

submission.setScreeningScore(Double.valueOf(String.valueOf(screeningScore)));

If screeningScore<screening minimum score

Set submission status to "Failed Screening"

Lookup submission status with name "Failed Screening" using
UploadManager (failedScreeningStatusId)

Set the status for the submission using
submission.setSubmissionStatus()

Update submission using Deliverable Management:
UploadManager.updateSubmission()

End If

End for

If there are no passing screenings, use the routine "**Insert Post-Mortem phase**".

Call sendEmail(phase,map) method of AbstractPhaseHandler

- supply the map with the following:
- SUBMITTER: a list containing 1 element for each submitter. Each submitter is represented as a map with following key SUBMITTER_HANDLE, SUBMITTER_SCORE, SUBMITTER_RESULT
- NO_SCREENING_PASS: 0 if no submissions passed screening, 1 otherwise

To get SUBMITTER array:

- Use Deliverable Management to search for submission with: ProjectId = phase.getProject().getId() AND submission type = "Contest Submission"

- For each Submission returned, get the owner: `submission.getUpload().getOwner()`
- Use Resource Management to get submitter (submitter is a resource):
`submitter = ResourceManager.getResource(submitterId)`
- To get the submitter score: get from `submission.getScreeningScore()`

1.3.31 Review Phase Handler

canPerform() - Can start

Review can start as soon as the dependency phases have ended

Use the routine "Check if all dependencies of a phase have correct status".

If phase.calcStartDate() is not null

Use the routine "Check if a phase start time is reached".

Check if count of active submissions with "Contest Submission" type is above 0 using "Search all active submissions with specific submission type for the project" routine

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase start time is not yet reached" (created in subroutine)

"No submissions that passed screening"

canPerform() - Can stop

- All dependencies are met

- All active submissions with "Contest Submission" type have one review scorecard from each reviewer for the phase

- All test case reviewers have one test case upload.

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Not all review scorecards are committed"

"Not all test cases are uploaded (see reviewer with XXX role)"

All active submissions have one review scorecard from each reviewer for the phase

Search all "Active" submissions with "Contest Submission" type for current project using "Search all active submissions with specific submission type for the project"

Search for reviewers with `resource_role_name = "Reviewer"` AND `phase id = phase.getId()` using "Search resource based on resource role names and phase id" routine

Search all review scorecards for the current phase with `resource_role_name = "Reviewer"` AND `phase id = phase.getId()` using "Search all reviews for a phase based on resource roles" routine

If number of reviewers == 0 return false.

Get "Reviewer Number" attribute from the phase if exists. If value of this attribute > actual number of reviewers, return false.

For each submission

Match the submission with its reviews by using `submission.getId()` and `review.getSubmission()`

Each submission should have the number of review scorecard = the number of reviewers.

Match the submission's reviews with the reviewer for consistence check by using

`review.getAuthor() = reviewer.getId()`

All reviews must be committed.

End For

All test case reviewers have one test case upload.

```

Find all test case reviewer IDs using InFilter search of Resource Management:
    Lookup resource role id using ResourceRoleLookupUtility
        "Accuracy Reviewer" - accuracyReviewerId
        "Failure Reviewer" - failureReviewerId
        "Stress Reviewer" - stressReviewerId
    Search for resource with: resource_role_id IN [accuracyReviewerId,
failureReviewerId, stressReviewerId] AND
    phase id = phase.getId() (reviewerIds)
    If number of reviewers = 0, the condition is met.
    Use UploadManager to search for uploads with the resourceId IN [reviewerIds
array]
    For each reviewerId
        To see if each reviewer has one test case upload
            Match reviewer and his upload by reviewerId = upload.getOwner()
    End For

```

perform() - Start

Call sendEmail(phase,map) method of AbstractPhaseHandler

- supply the map with the following:
- N_REVIEWERS: the number of available reviewers
- N_REQUIRED_REVIEWERS: the number of reviewers required
- NEED_REVIEWER: if N_REVIEWERS is less than REQUIRED_REVIEWERS
- SUBMITTER: a list containing 1 element for each submitter. Each submitter is represented as a map with following key SUBMITTER_HANDLE, SUBMITTER_RELIABILITY, SUBMITTER_RATING

To get SUBMITTER array:

- Use Deliverable Management to search for submission with: ProjectId = phase.getProject().getId() AND submission type = "Contest Submission"
- For each Submission returned, get the owner: submission.getUpload().getOwner()
- Use Resource Management to get submitter (submitter is a resource):
submitter = ResourceManager.getResource(submitterId)

To get N_REVIEWERS:

Use the "Search all reviews for a phase base on resource roles" routine

```

Input:
    - resourceRoleName: "Reviewer"
    - phaseId: reviewPhase.getId()

```

```

Output:
    - reviews[]

```

perform() - Stop

Initial score for the all passed screening submissions will be calculated and saved to the submitters' resource properties named "Initial Score". Submissions that passed screening will have status "Active" (instead of "Failed Screening"). For Studio competitions we need to perform the same operations as for AppealsResponse phase - populate places and update project with placement details.

Search all "Active" submissions with "Contest Submission" type for the current project using **"Search all active submissions with specific submission type for the project"** routine

Search the reviewers with resource_role_name = "Reviewer" AND phase id = phase.getId() using "Search resource based on resource role names and phase id" routine

Search all review scorecard for the current phase with resource_role_name = "Reviewer" AND phase id = phase.getId() using "Search all reviews for a phase based on resource roles" routine

For each submission

Match the submission with its reviews by using submission.getId() and review.getSubmission()

```

        Each submission should have the number of review scorecard = the number of
reviewers.
        Get the scores from the reviews scorecard using review.getScore()
        Use Review Score Aggregator to calculate aggregation of initial score
(agggScore)
        Set initial score to the submission using Submission#setInitialScore()
        Update submission in persistence using UploadManager#updateSubmission()
    End For

For Studio Competitions:
    Get all prizes with type "Submission Prize" for the project, order prizes
    by amount.
For each submission
    Match the submission with its reviews by using submission.getId() and
review.getSubmission()
    Each submission should has the number of review scorecard = the number of
reviewers.
    Get the scores from the reviews scorecard using review.getScore()

    Get submitterId: submitterId = submission.getUpload().getOwner()
    Use Resource Management to get submitter (submitter is a resource):
        submitter = ResourceManager.getResource(submitterId)
    Set "Final Score" to submission:
submission.setFinalScore(Double.valueOf(aggScore + ""))
    Break ties if exist: Submission with earlier upload date gets a higher
placement.
    Set "Placement" to submission: submission.setPlacement(new
Long(placement))
    Set prize for submission if placement is less then number of prizes.

    If reviewScore < minScore and submission status is "Active"
        Set the status for the submission to failedReviewStatus using
submission.setSubmissionStatus()
    Else
        If placement <> 1
            Set the status for the submission to noWinStatus using
submission.setSubmissionStatus()
        End If
    End If

    Update submission using Deliverable Management:
UploadManager.updateSubmission()

    Store the winning submitter in winningSubmitter
    Store the runner up submitter in runnerUpSubmitter

End For

Set project properties to store the winner and the runner up:
Get projectId
    projectId = phase.getProject().getId()
Gets the project instance using Project Management
    project = ProjectManager.getProject(projectId)

    Get the external reference id of the winner and the runner up, store in the
resource's property
    named "External Reference ID"
        winnerExtId = winningSubmitter.getProperty("External Reference ID")
        runnerExtId = runnerUpSubmitter.getProperty("External Reference ID")

    Set the winner for the project in the project property named "Winner External
Reference ID"

```

```

        project.setProperty("Winner External Reference ID", winnerExtId)
        Set the runner up for the project in the project property named "Runner-up
        External Reference ID"
        project.setProperty("Runner-up External Reference ID", runnerExtId)

```

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

- supply the map with the following:
- SUBMITTER: a list containing 1 element for each submitter. Each submitter is represented as a map with following key SUBMITTER_HANDLE, SUBMITTER_SCORE

To get SUBMITTER array:

- Use Deliverable Management to search for submission with: `ProjectId = phase.getProject().getId()`
- For each Submission returned, get the owner: `submission.getUpload().getOwner()`
- Use Resource Management to get submitter (submitter is a resource):
 `submitter = ResourceManager.getResource(submitterId)`
- To get the SUBMITTER_SCORE use `submission.getInitialScore()`;

1.3.32 Appeals Phase Handler

canPerform() - Can start

- Appeals can start as soon as the dependency phases have ended
 Use the routine "Check if all dependencies of a phase have correct status".
 If `phase.calcStartDate()` is not null
 Use the routine "Check if a phase start time is reached".

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)

canPerform() - Can stop

Appeals can start when:

- All dependencies are met.
- The period has passed.
 Use the "Check if a phase end time is reached" routine.
 Check if all submitters have elected to end appeals
 Get all submitters active in this project
- OR Appeals can be closed early (see `PhasesHelper#canCloseAppealsEarly()`):
 Lookup ID of "Submitter" role using `ResourceRoleLookupUtility` (`submitterRoleId`)
 Use `ResourceManager` to find resources (`earlyAppealCompletionsSubmitters`) with
 `resource_role_id = submitterRoleId`
 AND `project_id = phase.getProject().getId()`
 AND `extension_property_name = "Appeals Completed Early"`
 AND `extension_property_value = "Yes"`
 Search all "Active" submissions with "Contest Submission" type for the current project using **"Search all active submissions with specific submission type for the project"** routine
 For each found submission
 If `earlyAppealCompletionsSubmitters` doesn't contain a resource with ID equal to `submission.getUpload().getOwner()`
 The condition is not met (appeals cannot close early).
 End If
 End For

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase end time is not yet reached and appeals cannot be closed early"

perform() - Start and Stop

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

- supply the map with the following:
- SUBMITTER: a list containing 1 element for each submitter. Each submitter is represented as a map with following key `SUBMITTER_HANDLE`, `SUBMITTER_SCORE`
- To get SUBMITTER array:
- Use Deliverable Management to search for submission with: `ProjectId = phase.getProject().getId()` AND submission type = "Contest Submission"
- For each Submission returned, get the owner: `submission.getUpload().getOwner()`
- Use Resource Management to get submitter (submitter is a resource):
`submitter = ResourceManager.getResource(submitterId)`
- To get the `SUBMITTER_SCORE`, `submission.getInitialScore()`;

1.3.33 Appeals Response Phase Handler

canPerform() - Can start

Appeals Response can start as soon as the dependency phases have ended

Use the routine "Check if all dependencies of a phase have correct status".
If phase.calcStartDate() is not null

Use the routine "Check if a phase start time is reached".

If all conditions are met this method must return `OperationCheckResult.SUCCESS`.
Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)

canPerform() - Can stop

Appeals Response can end when:

The dependencies are met
All appeals are resolved.

If all conditions are met this method must return `OperationCheckResult.SUCCESS`.
Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Not all appeals are resolved"

The dependencies are met

Use the routine "Check if all dependencies of a phase have correct status".

All appeals are resolved

Find appeals:

Go back to the nearest Review phase using "Locating phases" routine

Get all reviews:

Use "Search resource based on resource role names and phase id" routine with current phase id and role IN ("Reviewer", "Accuracy Reviewer", "Failure Reviewer", "Stress Reviewer") to get reviewers

For each review from reviews

Use `review.getAllComments()` to get its comments

Use `comment.getCommentType().getName()` to find comments with type "Appeal" and "Appeal Response"

End For

If the numbers of Appeal and Appeal Response comments are equal, then all appeals are resolved.

perform() - Start

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

- supply the map with the following:
 - SUBMITTER: a list containing 1 element for each submitter. Each submitter is represented as a map with following key SUBMITTER_HANDLE, SUBMITTER_PRE_APPEALS_SCORE
- See map values retrieval details below.

perform() - Stop

When Appeals Response is stopping, all submissions with failed review scores should be set to the status Failed Review.

Overall score for the passing submissions should be calculated and saved to the submitters' resource properties together with their placements. The winner and runner-up should be populated in the project properties.

Submissions that do not win should be set to the status Completed Without Winning.

Update failed review submission status to "Failed Review":

Search all "Active" submissions with "Contest Submission" type for the current project using **"Search all active submissions with specific submission type for the project"** routine (`submissions[]`)

Locate the nearest previous Review Phase (`reviewPhase`)
Using "Locating phases" routine.

Search all review scorecards for the review phase

Use the "Search all reviews for a phase base on resource roles" routine

Input:

- resourceRoleName: ("Reviewer", "Accuracy Reviewer", "Failure Reviewer", "Stress Reviewer")
- phaseId: `reviewPhase.getId()`

Output:

- `reviews[]`

Get minimum review score (minScore)

Use the "Get the scorecard minimum score using a review"
(with the first instance in `reviews[]` array)

Use Review Score Aggregator to calculate aggregation of final score (`aggScore`) and placement (`placement`)

Lookup submission status for "Failed Review" using `UploadManager` class.
(`failedReviewStatus`)

Lookup submission status for "Completed Without Win" status using `UploadManager` class. (`noWinStatus`)

For each submission

Match the submission with its reviews by using `submission.getId()` and `review.getSubmission()`

Each submission should has the number of review scorecard = the number of reviewers.

Get the scores from the reviews scorecard using `review.getScore()`

Get submitterId: `submitterId = submission.getUpload().getOwner()`

Use Resource Management to get submitter (submitter is a resource):

`submitter = ResourceManager.getResource(submitterId)`

Set **"Final Score"** to submission:

`submission.setFinalScore(Double.valueOf(aggScore + ""))`

Break ties if exist: Submission with earlier upload date gets a higher placement.

Set **"Placement"** to submission: `submission.setPlacement(new Long(placement))`

```

        If aggScore < minScore and submission status is "Active"
            Set the status for the submission to failedReviewStatus using
            submission.setSubmissionStatus()
        Else
            If placement <> 1
                Set the status for the submission to noWinStatus using
                submission.setSubmissionStatus()
            End If
        End If

        Update submission using Deliverable Management:
        UploadManager.updateSubmission()

        Store the winning submitter in winningSubmitter
        Store the runner up submitter in runnerUpSubmitter

    End For

Set project properties to store the winner and the runner up:
    Get projectId
        projectId = phase.getProject().getId()
    Gets the project instance using Project Management
        project = ProjectManager.getProject(projectId)

    Get the external reference id of the winner and the runner up, store in the
    resource's property
        named "External Reference ID"
        winnerExtId = winningSubmitter.getProperty("External Reference ID")
        runnerExtId = runnerUpSubmitter.getProperty("External Reference ID")

    Set the winner for the project in the project property named "Winner External
    Reference ID"
        project.setProperty("Winner External Reference ID", winnerExtId)
    Set the runner up for the project in the project property named "Runner-up
    External Reference ID"
        project.setProperty("Runner-up External Reference ID", runnerExtId)

    Update the project
        Use ProjectManager.updateProject() method with updateReason="Update the
        winner and runner up."

    If there are no passes, use the routine "Insert Post-Mortem phase".

    Call sendEmail(phase,map) method of AbstractPhaseHandler
    - supply the map with the following:
    - SUBMITTER: a list containing 1 element for each submitter. Each submitter is
      represented as a map with following key SUBMITTER_HANDLE,
      SUBMITTER_PRE_APPEALS_SCORE, SUBMITTER_POST_APPEALS_SCORE, SUBMITTER_RESULT
    - To get SUBMITTER array:
    - Use Deliverable Management to search for submission with: ProjectId =
      phase.getProject().getId() AND submission type = "Contest Submission"
    - For each Submission returned, get the owner: submission.getUpload().getOwner()
    - Use Resource Management to get submitter (submitter is a resource):
      submitter = ResourceManager.getResource(submitterId)
    - To get the SUBMITTER_PRE_APPEALS_SCORE, submission.getInitialScore();
    - To get the SUBMITTER_POST_APPEALS_SCORE, submission.getFinalScore();

```

1.3.34 *Aggregation Phase Handler*

canPerform() - Can start

Aggregation can start as soon as:

The dependencies are met:

Use the routine "Check if all dependencies of a phase have correct status".

If `phase.calcStartDate()` is not null

Use the routine "Check if a phase start time is reached".

There is a winner:

Use "Get the winning submitter" routine.

There is an aggregator:

Use "Search resource based on resource role names and phase id" routine with "Aggregator" role. The number of found resources must be equal to 1.

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase start time is not yet reached" (created in subroutine)

"There is no winner for the project"

"There is no aggregator for the project"

canPerform() - Can stop

Aggregation can end when:

The dependencies are met;

The winning submission must have one aggregated review scorecard committed.

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Aggregation review scorecard is not yet committed"

The dependencies are met

Use the routine "Check if all dependencies of a phase have correct status".

The winning submission must have one aggregated review scorecard committed.

Search the aggregated review scorecard using the "Get worksheet" routine with "Aggregator" role. If found and `review.isCommitted()`, the condition is met.

perform() - Start

When Aggregation is starting and Aggregation worksheet is not created, it should be created; otherwise it should be marked uncommitted, as well as the aggregation review comments:

Find the previous "Aggregation" phase using "Locating phases" routine (`previousAggregationPhase`)

Use "Search resource based on resource role names and phase id" routine to find aggregator with "Aggregator" role and `phase_id = phase.getId()` (aggregator)

Throw `PhaseHandlingException` if aggregator cannot be found

Get aggregator user ID:

`aggregatorUserId = aggregator.getProperty("External Reference ID")`

If `previousAggregationPhase != null`

Search the aggregated review scorecard using the "Get worksheet" routine with "Aggregator" role. (`aggWorksheet`)

End If

If `aggWorksheet == null`

Create `aggWorksheet:Review` instance

Set author to `aggWorksheet`

`aggWorksheet.setAuthor(aggregator.getId())`

```

        Locate the last "Review" phase using "Locating phases" routine
(reviewPhase)
        Use "Search resource based on resource role names and phase id" routine to
find reviews with role IN ("Reviewer", "Accuracy Reviewer", "Failure Reviewer",
"Stress Reviewer") and phase_id = phase.getId() (reviewers)
        Use "Get the winning submitter" routine to find a winning submitter
(winningSubmitter). Throw PhaseHandlingException if not found.

        Use UploadManager to find a submissions with resource_id =
winningSubmitter.getId() AND submission type ID = <looked up ID for "Contest
Submission"> type (submissions)
        If no submissions found, throw PhaseHandlingException
        If number of found submissions > 1
            Iterate over all submissions to find one with
submission.getPlacement() == 1 (set it's ID to winningSubmissionId)
        End If
        Else winningSubmissionId = submissions[0].getId()

        Use "Search all reviews for a phase based on resource roles" routine to
find all reviews with role IN ("Reviewer", "Accuracy Reviewer", "Failure
Reviewer", "Stress Reviewer"), phase_id = reviewPhase.getId() and submission_id =
winningSubmissionId (reviews)

        For each review from reviews
            Set scorecard from review to aggWorksheet
            Set submission from review to aggWorksheet
            Copy comments and review items with types ("Comment", "Required",
"Recommended", "Appeal", "Appeal Response", "Aggregation Comment", "Aggregation
Review Comment", "Submitter Comment", "Manager Comment") from review to
aggWorksheet
        End For

        Lookup comment type for "Aggregation Review Comment" using ReviewManager
(agggregationReviewCommentType)
        Lookup comment type for "Submitter Comment" using ReviewManager
(submitterCommentType)
        For each reviewer from reviewers
            If review is aggregator ("External Reference ID" property equals to
aggregatorUserId)
                Create empty comment with agggregationReviewCommentType and
reviewer.getId() as author. Add it to aggWorksheet.
            End For
            Create empty comment with submitterCommentType and
winningSubmitter.getId() as author. Add it to aggWorksheet.

        Use ReviewManager to create aggWorksheet in persistence (using
createReview() method)

    Else // aggregation scorecard already exists
        Set author of aggWorksheet to aggregator.getId()
        Set scorecard committed flag to false
        Get all comments from the scorecard
        comments = aggWorksheet.getAllComments()
        For each comment
            Get comment extra info:
            extraInfo = comment.getExtraInfo()
            If extraInfo is "Approved" or "Accepted"
                comment.setExtraInfo("Approving")
            Else
                Clear comment extra info: comment.setExtraInfo(null);
            End If
        End For
    End For

```

Clone the aggWorksheet and persist it using ReviewManager#createReview()
End If

Call sendEmail(phase,map) method of AbstractPhaseHandler
- supply the map with the following:
- N_AGGREGATOR: the number of aggregator currently assigned

To find N_AGGREGATOR
Use "Search resource based on resource role names and phase id" with resource role name = "Aggregator" and phase_id = phase.getId()

perform() - Stop

Call sendEmail(phase,map) method of AbstractPhaseHandler

1.3.35 Aggregation Review Phase Handler

canPerform() - Can start

Aggregation can start as soon as the dependencies are met
Use the routine "Check if all dependencies of a phase have correct status".

If phase.calcStartDate() is not null
Use the routine "Check if a phase start time is reached".

If all conditions are met this method must return OperationCheckResult.SUCCESS.
Otherwise a new OperationCheckResult instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)

canPerform() - Can stop

The dependencies are met;
AND The time allotted for this review has expired
OR The aggregation review is performed by two reviewers other than the aggregator, and the winning submitter

If all conditions are met this method must return OperationCheckResult.SUCCESS.
Otherwise a new OperationCheckResult instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase end time is not yet reached and not all aggregation reviews are complete"

Locate the nearest backward Aggregation phase (aggPhase)
Use the "Locating phases" routine.

Search the aggregated review scorecard using the "Get worksheet" routine with "Aggregator" role. (aggWorksheet)

Get all comments: aggWorksheet.getAllComments() (comments[])

Locate the nearest Review phase (reviewPhase)

Use the "Locating phases" routine.

Locate the nearest Aggregation phase (aggregationPhase)

Use the "Locating phases" routine.

Use "Search resource based on resource role names and phase id"

Input:

- resourceRoleNames: "Reviewer", "Accuracy Reviewer", "Failure Reviewer", "Stress Reviewer"
- phaseId: reviewPhase.getId()

Output: reviewers[]

Use "Search resource based on resource role names and phase id"

Input:

- resourceRoleNames: "Aggregator"
- phaseId: aggregationPhase.getId()

Output: aggregators[]

If none found, throw PhaseHandlingException

Get aggregator user ID:

aggregatorUserId = aggregators[0].getProperty("External Reference ID")

Locate the winning submitter (winningSubmitter) using "Get the winning submitter" routine

For each reviewer from reviewers

If "External Reference ID" property of reviewer equals to aggregatorUserId, then continue

If comments doesn't contain any comment with author = reviewer.getId(), comment type = "Aggregation Review Comment" and extra info IN ("Approved", "Accepted", "Rejected"), then go to "phase end time is reached" check

End For

If comments contains any comment with author = winningSubmitter.getId(), comment type = "Submitter Comment" and extra info IN ("Approved", "Accepted", "Rejected"), then return true

Use the "Check if a phase end time is reached" routine.

If phase end time is reached

Approve pending aggregation review

Iterate over all comments from aggWorksheet:

If (comment type is "Submitter Comment" or "Aggregation Review Comment") and extra info is not IN ("Approved", "Rejected")

Make comment approved: comment.setExtraInfo("Approved")

Use ReviewManager#updateReview() to update aggWorksheet in persistence

End If

perform() - Start

Call sendEmail(phase) method of AbstractPhaseHandler

perform() - Stop

When Aggregation Review phase is stopping, if the aggregation is rejected by anyone, another aggregation/aggregation review cycle is inserted.

Use similar logic in "canPerform() - Can stop" to get resources[] and comments[]

Check comment.getExtraInfo() for each comment. Value must be

"Approved"/"Accepted" or "Rejected". Otherwise, throws PhaseHandlingException

If all comments are "Approved" or "Accepted"

return

Else (there is at least one reject)

Insert new aggregation/aggregation review cycle:

Get current project by phase.getProject()

(currentPrj)

Get current project phases

Phase[] phases = currentPrj.getAllPhases(). The phases is already sorted in the right order

Find the current phase in the array use phase.getId() (currentPhase)

Lookup phase types for "Aggregation" and "Aggregation Review" using PhaseManager

Lookup phase status for "Scheduled" using PhaseManager

```

        Create two Phase instances of
            Current project, "Scheduled" status, type "Aggregation" and
"Aggregation Review" respectively
        Insert the two new phase into "phases" array, after the currentPhase.
        Update the phases in currentPrj instance
            Using currentPrj.addPhase() methods
        Update the phases into persistence using Phase Management component
            Using PhaseManager.updatePhases()

        Search for old "Aggregator" resource (associated with the previous
aggregation phase). Clone it and associate a cloned resource with the new
aggregation phase.
        Persist cloned resource with ResourceManager#updateResource().
    End If

    Call sendEmail(phase) method of AbstractPhaseHandler

```

1.3.36 *Final Fix Phase Handler*

canPerform() - Can start

```

Final Fix can start as soon as:
    The dependencies are met
        Use the routine "Check if all dependencies of a phase have correct
status".
    If phase.calcStartDate() is not null
        Use the routine "Check if a phase start time is reached".
    There is a final reviewer available for the next final review:
        Locate the next "Final Review" phase using "Locating phases" routine
(finalReviewPhase)
        Use the "Search resource based on resource role names and phase id"
routine to find all resource with "Final Reviewer" role and phase_id =
finalReviewPhase.getId().
        If found one reviewer, the condition is met

```

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

```

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)
"Final Review phase cannot be located"
"There is no Final Reviewer assigned for the next Final Review phase"

```

canPerform() - Can stop

```

    The dependencies are met;
    The final fix has been uploaded;

```

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

```

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Final fix is not yet uploaded"

```

```

    The dependencies are met;
    Use the routine "Check if all dependencies of a phase have correct status".

```

```

    Check if the final fix has been uploaded
        Lookup upload type ID for "Final Fix" using UploadTypeLookupUtility
(uploadTypeId)

```



```

    Lookup upload status ID for "Active" using UploadStatusLookupUtility
(uploadStatusId)
    Use "Get the winning submitter" routine to get the winning submitter
(winningSubmitter)
    Use UploadManager to search for upload with: "Final Fix" type, "Active" status
and resource_id = winningSubmitter.getId()
    The result array must contain zero or one upload, throw PhaseHandlingException
otherwise.
    If result contains one upload, then the final fix is uploaded

```

perform() - Start

When Final Fix is starting and Final Review worksheet is not created, it should be created; otherwise it should be marked uncommitted. Previous final fix upload will be deleted.

```

    Find the forward and previous "Final Review" phases using "Locating phases"
routine (finalReviewPhase, previousFinalReviewPhase)
    Find the previous "Approval" phase using "Locating phases" routine
(previousApprovalPhase)

    Search for Final Reviewer using
    "Search resource based on resource role name and phase id"
    Input:
        - ResourceRoleName: "Final Reviewer"
        - phaseId: Current phase id (finalReviewPhase.getId())
    Output:
    resources[]

    If previousApprovalPhase != null
        Get the Approval worksheets:
        Search the Approval worksheets using the "Search all reviews for a
project based on resource roles" routine.
        Input:
            - projectId=phase.getProject().getId()
            - resourceRoleName="Approver"
        Output: reviews[]
        Get all project phases (phases)
        int count = 0;
        Create a list for approval worksheets (approvalWorksheets)
        For each phase from phases:
            If phase type is "Approval"
                Get "Reviewer Number" property for this phase (reviewerNumber)
                If phase is previousApprovalPhase
                    count += reviewerNumber;
                Else
                    Add from reviews[] to approvalWorksheets elements with indices
(count .. count + reviewerNumber - 1).
            End For

        finalWorksheet = new Review();
        For each approvalWorksheet from approvalWorksheets:
            Copy review items from approvalWorksheet to finalWorksheet.

    Else if previousFinalReviewPhase != null
        Get the Final Review worksheet:
        Get the Final Review worksheet using the "Get worksheet" routine with
"Final Reviewer" role (finalWorksheet).

    If finalWorksheet == null
        finalWorksheet = new Review()
        Set author: finalWorksheet.setAuthor(resources[0].getId())
        Make not committed: finalWorksheet.setCommitted(false)

```

```

        Find the "Aggregation" phase using "Locating phases" routine (aggPhase)
        If aggPhase != null
            Use the "Get worksheet" routine with "Aggregator" role (aggWorksheet)
            Copy comments and final review items with types ("Comment",
"Required", "Recommended", "Appeal", "Appeal Response", "Aggregation Comment",
"Aggregation Review Comment", "Submitter Comment", "Manager Comment") from
aggWorksheet to finalWorksheet
            Copy final review items from aggWorksheet to finalWorksheet
            finalWorksheet.setScorecard(aggWorksheet.getScorecard())
            finalWorksheet.setSubmission(aggWorksheet.getSubmission())
        Else
            Find the "Review" phase using "Locating phases" routine (reviewPhase)
            Use "Get winning submitter" routine (winningSubmitter). If not found,
throw PhaseHandlingException
            Use UploadManager to find submissions with resource_id =
winningSubmitter.getId() AND submission type = "Contest Submission" AND submission
status = "Active" (submissions)
            Throw PhaseHandlingException if number of found submissions != 1
            Get winning submission ID:
                winningSubmissionId = submissions[0].getId()

            Use "Search all reviews for a phase based on resource roles" routine
to find reviews for ("Reviewer", "Accuracy Reviewer", "Failure Reviewer", "Stress
Reviewer") roles, submission_id = winningSubmissionId and phase_id =
reviewPhase.getId(). (reviews)
            For each review from reviews
                finalWorksheet.setScorecard(review.getScorecard())
                finalWorksheet.setSubmission(review.getSubmission())
                Copy comments and review items with types ("Comment", "Required",
"Recommended", "Appeal", "Appeal Response", "Aggregation Comment", "Aggregation
Review Comment", "Submitter Comment", "Manager Comment") from review to
finalWorksheet
            End For
        End If

        Use ReviewManager#createReview() to persist finalWorksheet
    Else
        finalWorksheet.setAuthor(resources[0].getId())
        finalWorksheet.setCommitted(false)
        Clone finalWorksheet
        Use ReviewManager#createReview() to persist the cloned finalWorksheet
    End If

Delete the previous final fix
    Use similar logic as in "Check if the final fix has been uploaded" to get the
finalFix
    Set the finalFix upload status to "Deleted" use finalFix.setUploadStatus()
    Update the finalFix using UploadManager.updateUpload()

Call sendEmail(phase) method of AbstractPhaseHandler

perform() - Stop

Call sendEmail(phase) method of AbstractPhaseHandler

```

1.3.37 Final Review Phase Handler

canPerform() - Can start

Final Review can start as soon as the dependencies are met

Use the routine "Check if all dependencies of a phase have correct status".

If phase.calcStartDate() is not null

Use the routine "Check if a phase start time is reached".

If all conditions are met this method must return OperationCheckResult.SUCCESS. Otherwise a new OperationCheckResult instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase start time is not yet reached" (created in subroutine)

canPerform() - Can stop

Final Review can stop when:

The dependencies are met;

The final review is committed by the final reviewer.

If all conditions are met this method must return OperationCheckResult.SUCCESS. Otherwise a new OperationCheckResult instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Final review scorecard is not yet committed"

The dependencies are met:

Use the routine "Check if all dependencies of a phase have correct status".

Check if final review is committed by the final reviewer

Use the "Get worksheet" routine with "Final Reviewer" role to get the final review worksheet. (finalReview)

Check committed value

Using finalReview.isCommitted()

perform() - Start

Call sendEmail(phase,map) method of AbstractPhaseHandler

- supply the map with the following:

- N_FINAL_REVIEWERS: the number of final reviewers assigned

To get N_FINAL_REVIEWERS:

- "Search resource based on resource role name and phase id" with ResourceRoleName: "Final Reviewer" and phaseId:(phase.getId())

perform() - Stop

When Final Review phase is stopping, if the final review is rejected, another final fix/review cycle is inserted.

Find out if the final review is rejected

Use the "Get worksheet" routine with "Final Reviewer" role to get the final review worksheet. (finalReview)

Get all comments

finalReview.getAllComments() (comments[])

Search the result array and find the comment with

comment.getCommentType().getName()=="Final Review Comment" (frComment)

Check if the comment is approve or reject

If frComment.getExtraInfo()=="Rejected" then the final review is rejected.

Else if it's not "Approved" or "Accepted", throw PhaseHandlingException

Insert another final fix/review cycle

Use the routine "Insert final fix/review cycle"

Search for old "Final Reviewer" resource (associated with the current phase). Clone it and associate a cloned resource with the new "Final Review" phase.

Persist cloned resource with `ResourceManager#updateResource()`.

Else if approval phase doesn't already exist and "Approval Required" property of the project is "true", then insert approval phase if final review is approved

Use the routine "Insert Approval Phase"

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

- supply the map with the following:
- **RESULT:** The result of final fix: rejected/approved

To get **RESULT:** See **"Find out if the final review is rejected"** step above.

1.3.38 Approval Phase Handler

Change in 1.4: approval payment is now not set ("N/A") instead of setting it to 0.

canPerform() - Can start

Approval can start as soon as:

The dependencies are met:

Use the routine "Check if all dependencies of a phase have correct status".

If `phase.calcStartDate()` is not null

Use the routine "Check if a phase start time is reached".

There are enough approvers:

Use `ResourceManager` to find resources with `resource_role = "Approver"` and `project_id = phase.getProject().getId()`. Set the number of found resources to `projectApproversCount`.

Get "Reviewer Number" attribute from the phase (`approverNum`)

The condition is met when `projectApproversCount >= approverNum`

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase start time is not yet reached" (created in subroutine)

"There are not enough approvers assigned for the project"

canPerform() - Can stop

Approval can end when:

The dependencies are met;

AND The approval scorecards are committed:

At least the required number of Approver resources has been filled in a scorecard;

OR The time allotted for this approval phase has expired (see `PhasesHelper.reachedPhaseEndTime()` routine);

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase end time is not yet reached and not enough approval scorecards are committed"

The dependencies are met:

Use the routine "Check if all dependencies of a phase have correct status".

Check approval scorecards are committed

Use `ReviewManager` to find all reviews with resource role = "Approver" and `project_id = phase.getProject().getId()`. (`approveReviews`)

Remove all reviews that are not associated with the current phase from approveReviews. Also remove reviews that exceed "Reviewer Number" attribute of the phase.

If approveReviews is empty, return false

Check if the approval scorecards are committed

Walk the approveReviews[] array and check committed using approveReview.isCommitted().

Check enough approval scorecards are committed

If the committed count is equal to the number found in the phase's attribute "Reviewer Number" (use 1 if not specified), then all scorecards are committed. Otherwise condition fails due to some not being committed yet.

perform() - Start

Call sendEmail(phase,map) method of AbstractPhaseHandler

- supply the map with the following:
- N_APPROVERS: the number of available approvers
- N_REQUIRED_APPROVERS: the number of approvers required
- NEED_APPROVER: 1 if N_APPROVERS < N_REQUIRED_APPROVERS, 0 otherwise.

To get N_APPROVERS:

- See **"There are enough approvers"** above

perform() - Stop

When Approval phase is stopping, if the approval is rejected, another final fix/review cycle is inserted.

Check if approval rejected

Get approveReviews as described in "Check approval scorecards are committed" above

Iterate over review.getAllComments() of each review from approveReviews:

If comment.getCommentType().getName()=="Approval Review Comment"

If comments.getExtraInfo()=="Rejected", the approval is rejected

Else if comments.getExtraInfo() is not "Approved" or "Accepted", throw PhaseHandlingException

If approval rejected

Use the routine "Insert final fix/review cycle"

Search for old "Final Reviewer" resource (associated with the current phase). Clone it and associate a cloned resource with the new "Final Review" phase.

Persist cloned resource with ResourceManager#updateResource().

Else

Iterate over review.getAllComments() of each review from approveReviews:

If comment.getCommentType().getName()=="Approval Review Comment - Other Fixes" and comments.getExtraInfo()=="Required" then other fixes are required

If other fixes are required

Get project with ProjectManager#getProject(phase.getProject().getId()) (project)

project.setProperty("Requires Other Fixes", "true")

Update project in persistence using ProjectManager#updateProject()

Call sendEmail(phase,map) method of AbstractPhaseHandler

- supply the map with the following:
- RESULT: the approval result: approved/rejected

To get RESULT: See **"Check if approval rejected"** above

1.3.39 Post-Mortem Phase Handler

canPerform() - Can start

Post-mortem can start as soon as the dependencies are met

Use the routine "Check if all dependencies of a phase have correct status".

If phase.calcStartDate() is not null

Use the routine "Check if a phase start time is reached".

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase start time is not yet reached" (created in subroutine)

canPerform() - Can stop

Post-mortem can start when

The dependencies are met;

The period has passed.

Use the "Check if a phase end time is reached" routine.

The post-mortem scorecards are committed;

At least the required number of Post-Mortem Reviewer resources have filled in a scorecard;

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)

"Phase end time is not yet reached"

"Not enough post-mortem scorecards are committed"

Check the dependencies are met:

Use the routine "Check if all dependencies of a phase have correct status".

Check post-mortem scorecards are committed:

Use `ResourceManager` to find resources with `resource_role = "Post-Mortem Reviewer"` and `project_id = phase.getProject().getId()`. (`postMortemReviews`)

Check if the post-mortem scorecards are committed

Walk the `postMortemReviews[]` array and check committed using `postMortemReview.isCommitted()`

Check enough post-mortem scorecards are committed

If the committed count is \geq than the number found in the phase's attribute "Reviewer Number", then the condition is met. Otherwise condition fails due to some not being committed yet.

perform() - Start

Get all resource roles with `ResourceManager.getAllResourceRoles()` call (`resourceRoles`)

Find a role with name equal to "Post-Mortem Reviewer" in `resourceRoles` (`postMortemReviewerRole`)

Search for all existing post-mortem resources for the current project

(`existingPostMortemResources:Resource[]`)

Search for resources with "Submitter", "Reviewer", "Accuracy Reviewer", "Failure Reviewer", "Stress Reviewer" and "Copilot" role names for the current project

(`candidatePostMortemResources:Resource[]`)

For each resource in `candidatePostMortemResources`

`valid = false`

If resource role name for resource is "Submitter"

If `resource.getSubmissions()` is not empty, `valid = true`

Else

`valid = true`

```

End If

If valid
    Get "External Reference ID" property from resource (candidateId)
    If existingPostMortemReviewer doesn't contain a resource with "External
Reference ID" property equal to candidateId
        Check if user has pending terms
        Get terms-specific services
        ManagerHelper.getProjectTermsOfUse()
        ManagerHelper.getUserTermsOfUse()
        Get necessary terms of use for resource's role using
projectRoleTermsOfUse.getTermsOfUse() (necessaryTerms)
        For each necessaryTerm from necessaryTerms
            If userTermsOfUse.hasTermsOfUse() returns true for specific
termsId and userId, the user has pending terms
        End For
        If user doesn't have pending terms
            Create new Resource instance for postMortemReviewerRole. Copy to
it properties of resource: "External Reference ID", "Handle", "Email" and
"Rating".
            Set "Registration Date" property of this Resource instance to the
current timestamp.
            Set "Payment Status" property of this Resource instance to "N/A".
            Persist this new resource using resourceManager.updateResource()
method
        End If
    End If
End If
End For

Call sendEmail(phase,map) method of AbstractPhaseHandler
- supply the map with the following:
- NEED_POST_MORTEM_REVIEWERS: if N_POST_MORTEM_REVIEWERS <
N_REQUIRED_POST_MORTEM_REVIEWERS, set to 1, otherwise set to 0.
- N_POST_MORTEM_REVIEWERS: the number of post mortems reviewers available
- N_REQUIRED_POST_MORTEM_REVIEWERS: the number of required post mortems reviewers

To get N_POST_MORTEM_REVIEWERS:
- See "Check post-mortem scorecards are committed" above

perform() - Stop

Call sendEmail(phase,map) method of AbstractPhaseHandler

```

1.3.40 Milestone Submission Phase Handler

canPerform() - Can start

Milestone Submission phase can start as soon as:

- The dependencies are met
- Phase start date/time is reached (if specified)

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)

Check the dependencies are met

Use the routine **"Check if all dependencies of a phase have correct status"**.

If `phase.calcStartDate()` is not null

Use the routine **"Check if a phase start time is reached"**.

PhaseHelper.canPhaseStart() method can be reused.

canPerform() - Can stop

Milestone Submission phase can stop when all of these conditions met:

- The dependencies are met
- The period has passed
- If there are no milestone submissions OR:
 - If manual milestone screening is required, the number of milestone submissions that have passed manual milestone screening meets the required number.

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase end time is not yet reached"
"Not enough milestone submissions for the project"

The dependencies are met

Use the routine **"Check if all dependencies of a phase have correct status"**.

The period has passed

Use the **"Check if a phase end time is reached"** routine.

Check if there are any submissions (see `SubmissionPhaseHandler#hasAnySubmission()` for reference):

Search for all active submissions with **"Milestone Submission"** type using **"Search all active submissions with specific submission type for the project"** routine.

If the number of found submissions == 0, return true.

Else if manual milestone screening is required, the number of milestone submissions that have passed manual milestone screening should meet the required number. (See below)

Get the required number of submission that passed milestone screening, if the attribute is null (missing), return true (it means we don't need to check the condition that the required number of submission that passed milestone screening).

Get the **"Submission Number"** phase attribute

String subNumber = phase.getAttribute("Submission Number")

If (subNumber == null) return null.

The number of milestone submissions that have passed manual milestone screening meets the required number:

Search all milestone screening scorecards for the current phase:

Locate the next milestone screening phase using **"Locating phases"** routine. Get the `milestoneScreeningPhaseId`, if milestone screening phase does not exist, simply return true.

Use the **"Search all reviews for a phase base on resource roles"** routine.

Input:

- `phaseId`=`milestoneScreeningPhaseId`
- `resourceRoleNames`=**"Milestone Screener"**

Output:

- `milestoneScreenReviews[]`

Get the milestone screening minimum score:

Use the **"Get the scorecard minimum score using a review"** routine:
(With the first instance in `milestoneScreenReviews[]`)

Count the number submissions that pass screening
`passedNum = 0`


```

    For each milestoneScreenReviews
        If milestoneScreenReviews.getScore() >= minScore
            passedNum++
        End If
    End For
    Check if passedNum >= subNumber

```

perform() - Start

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

perform() - Stop

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

Supply the map with the following:

- `N_SUBMITTERS` : the number of milestone submitters
- `SUBMITTER`: a list containing 1 element for each submitter. Each submitter is represented as a map with the following keys: `SUBMITTER_HANDLE`, `SUBMITTER_RELIABILITY`, `SUBMITTER_RATING`

To get `SUBMITTER` array:

- Use **Deliverable Management** to search for submission with: `ProjectId = phase.getProject().getId()` AND submission type ID = looked up "**Milestone Submission**" type ID
- For each Submission returned, get the owner: `submission.getUpload().getOwner()`
- Use **Resource Management** to get submitter (submitter is a resource):
`submitter = ResourceManager.getResource(submitterId)`

1.3.41 *Milestone Screening Phase Handler*

canPerform() - Can start

Milestone Screening phase can start as soon as:

- *The dependencies are met*
- *Phase start date/time is reached (if specified)*
- *There are submissions with "Milestone Submission" type.*

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)
"There are no milestone submissions for the project"

Check the dependencies are met

Use the routine "**Check if all dependencies of a phase have correct status**".

If `phase.calcStartDate()` is not null

Use the routine "**Check if a phase start time is reached**".

There are submissions with "Milestone Submission" type.

Use "**Search all active submissions with specific submission type for the project**" routine.

canPerform() - Can stop

Milestone Screening phase can stop when:

- *The dependencies are met*
- *All milestone submissions have one milestone screening scorecard committed.*

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Not all milestone screening scorecards are committed (see submission with ID=XXX)"

The dependencies are met

Use the routine **"Check if all dependencies of a phase have correct status"**.

All milestone submissions have one milestone screening scorecard committed.

Search all milestone screening scorecards for the current phase:

Use the **"Search all reviews for a phase base on resource roles"** routine.

Input:

- `phaseId=phase.getId()` (current phase id)
- `resourceRoleName="Milestone Screener"`

Output:

- `milestoneScreenReviews[]`

Search all active milestone submissions with "Milestone Submission" type for the current project using "Search all active submissions with specific submission type for the project" routine (`submissions[]`)

Number of reviews must be equal to the number of submissions.

Check if every milestone submission has an associated screening scorecard

For each milestone submission

Look for its matching scorecard using

`submission.getId()==screenReview.getSubmission()`

End For

Check if all of the screening scorecards are committed

Walk the `milestoneScreenReviews[]` and check

`milestoneScreenReview.isCommitted()`

perform() - Start

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

- supply the map with the following:
- `NEED_MILESTONE_SCREENERS` : set to 1 if milestone screener is not available, 0 otherwise
- `SUBMITTER`: a list containing 1 element for each submitter. Each submitter is represented as a map with following key `SUBMITTER_HANDLE`, `SUBMITTER_RELIABILITY`, `SUBMITTER_RATING`

To get `NEED_MILESTONE_SCREENERS`:

- Lookup resource role id for "Milestone Screener" using `ResourceRoleLookupUtility` (`milestoneScreenerId`)
- Use **Resource Management** to search for resource with the resource role id = `"milestoneScreenerId"`
- If this is null then `NEED_MILESTONE_SCREENERS` is set to 1

To get `SUBMITTER` array:

- Use `Deliverable Management` to search for submission with: `ProjectId = phase.getProject().getId()` AND submission type = **"Milestone Submission"**
- For each Submission returned, get the owner: `submission.getUpload().getOwner()`
- Use **Resource Management** to get submitter (submitter is a resource):
`submitter = ResourceManager.getResource(submitterId)`

perform() - Stop

When screening is stopping:

- All submissions with failed screening scorecard scores should be set to the status "Failed Milestone Screening"
- Screening score for the all submissions will be saved to the submitters' resource properties named "Milestone Screening Score".

Search all submissions with "**Milestone Submission**" type for current project using "**Search all active submissions with specific submission type for the project**" routine (submissions[]).

Search all screening scorecard for the current phase:

Use the "**Search all reviews for a phase base on resource roles**" routine.

Input:

- phaseId=phase.getId() (current phase id)
- resourceRoleNames="Milestone Screener"

Output:

- screenReviews[]

Throw PhaseHandlingException if the number of submissions is not equal to the number of screening scorecards.

Get the screening minimum score:

Use the "**Get the scorecard minimum score using a review**" routine.

(With the first instance in screenReviews[])

For each submission

Find the matching screening review using submission.getId() =
screeningReview.getSubmission()
Get submission's screening score: screeningScore =
screeningReview.getScore()

Store the screening score for the submission

Set screening score:

submission.setScreeningScore(Double.valueOf(String.valueOf(screeningScore)));

If screeningScore < screening minimum score

Set submission status to "Failed Milestone Screening", this submission will no longer be active, which will be eliminated from being reviewed.

Lookup submission status with name "Failed Milestone Screening" using UploadManager (failedScreeningStatusId) (See PhaseHelper.
getSubmissionStatus() for reference)

Set the status for the submission using
submission.setSubmissionStatus()

Update submission using **Deliverable Management**:
UploadManager.updateSubmission()

End If

End for

Call sendEmail(phase,map) method of AbstractPhaseHandler

- supply the map with the following:
- SUBMITTER: a list containing 1 element for each submitter. Each submitter is represented as a map with following key SUBMITTER_HANDLE, SUBMITTER_SCORE, SUBMITTER_RESULT
- NO_SCREENING_PASS: 0 if no submissions passed screening, 1 otherwise

To get SUBMITTER array:

- Use **Deliverable Management** to search for submission with: ProjectId = phase.getProject().getId() AND submission type = "**Milestone Submission**"
- For each Submission returned, get the owner: submission.getUpload().getOwner()
- Use **Resource Management** to get submitter (submitter is a resource):
submitter = ResourceManager.getResource(submitterId)
- To get the submitter score: get from submission.getScreeningScore()

1.3.42 Milestone Review Phase Handler

canPerform() - Can start

Review can start as soon as:

- *The dependencies are met*
- *Phase start date/time is reached (if specified)*
- *There is at least one active submission with "Milestone Submission".*

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Phase start time is not yet reached" (created in subroutine)
"There are no milestone submissions that passed screening for the project"

Check the dependencies are met

Use the routine **"Check if all dependencies of a phase have correct status"**.

If phase.calcStartDate() is not null

Use the routine **"Check if a phase start time is reached"**.

Check there is at least one active submission with "Milestone Submission" type.

Use **"Search all active submissions with specific submission type for the project"** routine

canPerform() - Can stop

- *All dependencies are met*
- *Milestone reviewer is assigned for the project*
- *All active submissions with "Milestone Submission" type have one review scorecard for the phase*

If all conditions are met this method must return `OperationCheckResult.SUCCESS`. Otherwise a new `OperationCheckResult` instance with one of the following explanation messages must be constructed and returned:

"Dependency XXX phase is not yet started/ended" (created in subroutine)
"Milestone reviewer is not assigned for the project"
"Not all milestone review scorecards are committed (see submission with ID=XXX)"

All active submissions have one review scorecard for the phase

Search all active submissions with **"Milestone Submission"** type for current project using **"Search all active submissions with specific submission type for the project"** routine (submissions[])

Search for milestone reviewer with `resource_role_name = "Milestone Reviewer"` AND `phase id = phase.getId()` using **"Search resource based on resource role names and phase id"** routine (reviewers[])

If numbers of reviewers == 0 return false;

If numbers of reviewers != 1 throw `PhaseHandlingException`.

Search all review scorecards for the current phase with `resource_role_name = "Milestone Reviewer"` AND `phase id = phase.getId()` using **"Search all reviews for a phase based on resource roles"** routine (reviews[])

If `submissions.length != reviews.length`, throw `PhaseHandlingException`.

For each submission

Match the submission with its review by using `submission.getId()` and `review.getSubmission()`

Each submission should have one review scorecard from milestone reviewer (`reviewers[0]`) and the review must be committed.

End For

perform() - Start

Call `sendEmail(phase,map)` method of `AbstractPhaseHandler`

- supply the map with the following:
- `NEED_MILESTONE_REVIEWER` : set to 1 if milestone reviewer is not available, 0 otherwise
- `SUBMITTER`: a list containing 1 element for each submitter. Each submitter is represented as a map with following key `SUBMITTER_HANDLE`, `SUBMITTER_RELIABILITY`, `SUBMITTER_RATING`

To get `NEED_MILESTONE_REVIEWER`:

- Lookup resource role id for "Milestone REVIEWER" using `ResourceRoleLookupUtility (milestoneReviewerId)`
- Use **Resource Management** to search for resource with the resource role id = "milestoneReviewerId"
- If this is null then `NEED_MILESTONE_REVIEWER` is set to 1

To get `SUBMITTER` array:

- Use **Deliverable Management** to search for submission with: `ProjectId = phase.getProject().getId()` AND submission type = "**Milestone Submission**"
- For each Submission returned, get the owner: `submission.getUpload().getOwner()`
- Use **Resource Management** to get submitter (submitter is a resource):
 `submitter = ResourceManager.getResource(submitterId)`

perform() - Stop

Initial score for the all passed screening submissions will be calculated and saved to the submitters' resource properties named "Initial Score". Submissions that passed screening will have status "Active" (instead of "Failed Milestone Screening")

Search all active submissions with "**Milestone Submission**" type for the current project using "**Search all active submissions with specific submission type for the project**" routine (`submissions[]`)

Search the reviewers with `resource_role_name = "Milestone Reviewer"` AND `phase id = phase.getId()` using "**Search resource based on resource role names and phase id**" routine (`reviewers[]`)

Search all review scorecards for the current phase with `resource_role_name = "Milestone Reviewer"` AND `phase id = phase.getId()` using "**Search all reviews for a phase based on resource roles**" routine (`reviews[]`)

```
submissionScores = new  
com.topcoder.management.review.scoreaggregator.Submission[submissions.length]
```

```
For each submission  
    Match the submission with its reviews by using submission.getId() and  
    review.getSubmission()  
    Each submission should have exactly one review scorecard.  
    Get the score from the review scorecard using review.getScore()  
    Set initial score to the submission using Submission#setInitialScore()  
    Set final score to the submission using Submission#setFinalScore()  
    Put(submission ID, score) pair to submissionScores array  
End For
```

```
Aggregate scores using ManagerHelper#getScorecardAggregator():  
scoreAggregator.aggregateScores(submissionScores) (aggregations)
```

```
Calculate placements:
```

```

scoreAggregator.calcPlacements(aggregations) (placements)

Get minimum passing score using ManagerHelper#getScorecardManager() (minScore)
Get "Failed Milestone Review" submission status (failedStatus)

For each submission from submissions:
    Find the corresponding rankedSubmission from placements where
rankedSubmission.getId() == submission.getId()
    Set placement to the submission:
        submission.setPlacement(rankedSubmission.getRank() * 1L)
    If rankedSubmission.getAggregatedScore() < minScore
        Set status of the submission to "Failed Milestone Review":
            submission.setSubmissionStatus(failedStatus)
End For

Get all project prizes: project.getPrizes() (prizes)
Remove from prizes all prizes for which prize.getPrizeType().getDescription()
is not equal to "Milestone Prize".
Sort prizes by placement.
Sort submissions by placement, and if equal - by creation timestamps.

currentPrize = prizes.get(0);
currentPrizeIndex = 0;
currentPrizeNumLeft = currentPrize.getNumberOfSubmissions();
For i = 0 .. submissions.length - 1:
    If placement of submissions[i] == currentPrize.getPlace()
        If currentPrizeNumLeft > 0
            Decrease currentPrizeNumLeft by 1.
        Else continue;
    Else
        Increase currentPrizeIndex by 1.
        If currentPrizeIndex >= prizes.size()
            break;
        Else
            currentPrize = prizes.get(currentPrizeIndex);
            currentPrizeNumLeft = currentPrize.getNumberOfSubmissions();
        Set prize to the submission: submission.setPrize(currentPrize);
End For

For each submission from submissions:
    Update submission in persistence:
        ManagerHelper#getUploadManager().updateSubmission(submission)
End For

Call sendEmail(phase,map) method of AbstractPhaseHandler
- supply the map with the following:
- SUBMITTER: a list containing 1 element for each submitter. Each submitter is
  represented as a map with following key SUBMITTER_HANDLE, SUBMITTER_SCORE

To get SUBMITTER array:
    Use Deliverable Management to search for submission with: projectId =
phase.getProject().getId()
    For each Submission returned, get the owner: submission.getUpload().getOwner()
        Use Resource Management to get submitter (submitter is a resource):
            submitter = ResourceManager.getResource(submitterId)
        To get the SUBMITTER_SCORE use submission.getInitialScore();

```

1.3.43 *Logging*

Logging using the Logging Wrapper has been added to the following handlers:

- MilestoneSubmissionPhaseHandler
- MilestoneScreeningPhaseHandler

- MilestoneReviewPhaseHandler
- SpecificationSubmissionPhaseHandler
- SpecificationReviewPhaseHandler
- RegistrationPhaseHandler
- ReviewPhaseHandler
- AppealsPhaseHandler
- AggregationPhaseHandler
- AggregationReviewPhaseHandler
- PostMortemPhaseHandler

There is no coherent strategy for logging found across those four classes, confirming that they have been added ad hoc. As such, it is necessary to outline logging in each case, as is done below. The classes do use the helper class LogMessage.

1.3.44 *ReviewPhaseHandler*

canPerform - stop: Logs details whether the dependencies are done, whether reviews are finished, and all test cases uploaded, all at INFO level. The methods to check the last two conditions perform additional DEBUG and INFO logging detailing their processing.

1.3.45 *AppealsPhaseHandler*

canPerform – stop: Logs just the error if something goes wrong during the check whether appeals phase can be stopped.

1.3.46 *AggregationPhaseHandler*

canPerform - stop: Logs at WARN level that this stage cannot begin because there are no winners or there is no aggregator.

Uses ERROR level logging for error conditions in the perform method and when there are no winners or there is no aggregator.

Logs at INFO level when creating the aggregation worksheet.

1.3.47 *AggregationReviewPhaseHandler*

Logs at DEBUG level when entering or exiting canPerform method, when at the code point of checking if the phase is starting or ending, and when automatically approving aggregation reviews. Logs at INFO when entering process of approving the aggregation review

Logs at WARN when it cannot approve reviews automatically.

Logs in the following manner when checking of aggregation review is done:

- INFO if there is no review or aggregation phase in the project
- DEBUG if there is not aggregator assigned
- INFO if the aggregator or submitter has not commented

1.3.48 *SpecificationSubmissionPhaseHandler and SpecificationReviewPhaseHandler*

These classes just need to log all thrown exceptions at ERROR level. Logging in the new handlers must be performed consistently with the existing handlers.

1.3.49 *RegistrationPhaseHandler*

canPerform – start: Logs just the error if something goes wrong when checking whether all parent projects are completed.

1.3.50 *PostMortemPhaseHandler*

perform – start: Logs the warning when user has pending terms, and thus cannot be assigned as a Post-Mortem Reviewer.

1.4 **Component Class Overview**

ManagerHelper

This is the helper class to load manager instances from a default configuration namespace.

Changes in 1.6.1:

- Removed `screeningManager` together with its getter.
- Removed private `initScreeningManager()` method.

AbstractPhaseHandler

This abstract class is used as a base class for all phase handlers. This class contains logic in the constructor to load configuration settings for a phase handler. Settings include database connection, email template and email related information.

AggregationPhaseHandler

This class implements `PhaseHandler` interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection and email sending. This class handles the aggregation phase. If the input is of other phase types, `PhaseNotSupportedException` will be thrown.

Please see details about this handler in the section 1.3.34.

Changes in 1.6.1:

- `canPerform()` method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

AggregationReviewPhaseHandler

This class implements `PhaseHandler` interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection and email sending. This class handles the aggregation review phase. If the input is of other phase types, `PhaseNotSupportedException` will be thrown.

Please see details about this handler in the section 1.3.35.

Changes in 1.6.1:

- `canPerform()` method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

AppealsPhaseHandler

This class implements `PhaseHandler` interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection and email sending. This class handles the appeals phase. If the input is of other phase types, `PhaseNotSupportedException` will be thrown.

Please see details about this handler in the section 1.3.32.

Changes in 1.6.1:

- `canPerform()` method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

AppealsResponsePhaseHandler

This class implements `PhaseHandler` interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include

database connection and email sending. This class handles the appeals response phase. If the input is of other phase types, `PhaseNotSupportedException` will be thrown. Please see details about this handler in the section 1.3.33.

Changes in 1.6.1:

- `canPerform()` method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

ApprovalPhaseHandler

This class implements `PhaseHandler` interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection and email sending. This class handles the approval phase. If the input is of other phase types, `PhaseNotSupportedException` will be thrown. Please see details about this handler in the section 1.3.38.

Changes in 1.4: Updated not to use `ContestDependencyAutomation`. Approval phase ends when at the scheduled time even when there are no submitted approval scorecards.

Changes in 1.6.1:

- `canPerform()` method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

FinalFixPhaseHandler

This class implements `PhaseHandler` interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection and email sending. This class handles the aggregation phase. If the input is of other phase types, `PhaseNotSupportedException` will be thrown. Please see details about this handler in the section 1.3.36.

Changes in 1.6.1:

- `canPerform()` method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

FinalReviewPhaseHandler

This class implements `PhaseHandler` interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection, email sending. This class handles the final review phase. If the input is of other phase types, `PhaseNotSupportedException` will be thrown. Please see details about this handler in the section 1.3.37.

Change in 1.4: Updated not to use `ContestDependencyAutomation`.

Changes in 1.6.1:

- `canPerform()` method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

PostMortemPhaseHandler

This class implements `PhaseHandler` interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection, email sending and the required number of registration. This class handles the registration phase. If the input is of other phase types, `PhaseNotSupportedException` will be thrown. Please see details about this handler in the section 1.3.39.

Changes in 1.6.1:

- `canPerform()` method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

SpecificationSubmissionPhaseHandler

This class implements PhaseHandler interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection and email sending parameters. This class handles the specification submission phase. If the input is of other phase types, PhaseNotSupportedException will be thrown. Please see details about this handler in the section 1.3.26.

Changes in 1.6.1:

- canPerform() method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

SpecificationReviewPhaseHandler

This class implements PhaseHandler interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection and email sending parameters. This class handles the specification review phase. If the input is of other phase types, PhaseNotSupportedException will be thrown. Please see details about this handler in the section 1.3.27.

Changes in 1.6.1:

- canPerform() method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

RegistrationPhaseHandler

This class implements PhaseHandler interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection, email sending and the required number of registration. This class handles the registration phase. If the input is of other phase types, PhaseNotSupportedException will be thrown. Please see details about this handler in the section 1.3.28.

Change in 1.4: Dependency projects are checked and project start delayed if required only if this phase is the first phase in the project.

Changes in 1.6.1:

- canPerform() method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

ReviewPhaseHandler

This class implements PhaseHandler interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection and email sending. This class handles the review phase. If the input is of other phase types, PhaseNotSupportedException will be thrown. Please see details about this handler in the section 1.3.31.

Changes in 1.6.1:

- canPerform() method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

ScreeningPhaseHandler

This class implements PhaseHandler interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection, email sending. This class handles the screening phase. If the input is of other phase types, PhaseNotSupportedException will be thrown. Please see details about this handler in the section 1.3.30.

Changes in 1.6.1:

- canPerform() method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

SubmissionPhaseHandler

This class implements PhaseHandler interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection, email sending and the required number of submissions that pass screening. This class handles the submission phase. If the input is of other phase types, PhaseNotSupportedException will be thrown.

Please see details about this handler in the section 1.3.29.

Changes in 1.6.1:

- canPerform() method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed
- Removed private methods arePassedSubmissionsEnough(), getManualScreeningPasses() and getAutoScreeningPasses().

MilestoneReviewPhaseHandler

This class implements PhaseHandler interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection and email sending. This class handles the milestone review phase. If the input is of other phase types, PhaseNotSupportedException will be thrown.

Please see details about this handler in the section 1.3.39.

Changes in 1.6.1:

- canPerform() method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

MilestoneScreeningPhaseHandler

This class implements PhaseHandler interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection, email sending. This class handles the milestone screening phase. If the input is of other phase types, PhaseNotSupportedException will be thrown.

Please see details about this handler in the section 1.3.38.

Changes in 1.6.1:

- canPerform() method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

MilestoneSubmissionPhaseHandler

This class implements PhaseHandler interface to provide methods to check if a phase can be executed and to add extra logic to execute a phase. It will be used by Phase Management component. It is configurable using an input namespace. The configurable parameters include database connection, email sending and the required number of submissions that pass screening. This class handles the milestone submission phase. If the input is of other phase types, PhaseNotSupportedException will be thrown.

Please see details about this handler in the section 1.3.37.

Changes in 1.6.1:

- canPerform() method was updated to return not only true/false value, but additionally an explanation message in case if operation cannot be performed

PhaseStatusLookupUtility

This class provides the function to get lookup id from a lookup name of "phase_status_lu" table. Since lookup id/value pairs do not change in the database per installation, this class caches the id/value pairs to minimize queries to the database. This class is used in various methods of PhaseHandler implementations.

PhaseTypeLookupUtility

This class provides the function to get lookup id from a lookup name of "phase_type_lu" table. Since lookup id/value pairs do not change in the database per installation, this class caches the id/value pairs to minimize queries to the database. This class is used in various methods of PhaseHandler implementations.

ProjectInfoTypeLookupUtility

This class provides the function to get lookup id from a lookup name of "project_info_type_lu" table. Since lookup id/value pairs do not change in the database per installation, this class caches the id/value pairs to minimize queries to the database. This class is used in various methods of PhaseHandler implementations.

ResourceRoleLookupUtility

This class provides the function to get lookup id from a lookup name of "resource_role_lu" table. Since lookup id/value pairs do not change in the database per installation, this class caches the id/value pairs to minimize queries to the database. This class is used in various methods of PhaseHandler implementations.

SubmissionStatusLookupUtility

This class provides the function to get lookup id from a lookup name of "submission_status_lu" table. Since lookup id/value pairs do not change in the database per installation, this class caches the id/value pairs to minimize queries to the database. This class is used in various methods of PhaseHandler implementations.

SubmissionTypeLookupUtility

This class provides the function to get lookup id from a lookup name of "submission_type_lu" table. Since lookup id/value pairs do not change in the database per installation, this class caches the id/value pairs to minimize queries to the database. This class is used in various methods of PhaseHandler implementations.

UploadStatusLookupUtility

This class provides the function to get lookup id from a lookup name of "upload_status_lu" table. Since lookup id/value pairs do not change in the database per installation, this class caches the id/value pairs to minimize queries to the database. This class is used in various methods of PhaseHandler implementations.

UploadTypeLookupUtility

This class provides the function to get lookup id from a lookup name of "upload_type_lu" table. Since lookup id/value pairs do not change in the database per installation, this class caches the id/value pairs to minimize queries to the database. This class is used in various methods of PhaseHandler implementations.

NotificationTypeLookupUtility

This class provides the function to get lookup id from a lookup name of "notification_type_lu" table. Since lookup id/value pairs do not change in the database per installation, this class caches the id/value pairs to minimize queries to the database. This class is used in various methods of PhaseHandler implementations.

EmailOptions

This class represents email options. It is a container for the set of options related to email to be send, such as subject, from address, template name and whether the email is to be sent or not.

LogMessage

This class encapsulates the entry log data and generates consistent log messages.
Changes in 1.4: Made just some trivial fixes to meet TopCoder standards.

PhasesHelper

The class having helper methods to perform argument validation and other phase related methods used by the PhaseHandler implementations.

Changes in 1.4:

- Some methods that perform common operations used by existing and new handlers were added: `isFirstPhase()` and `insertSpecSubmissionSpecReview()`.
- `getScreeningTasks()` and `searchActiveSubmissions()` methods were updated to support submission types.

Changes in 1.6:

- Removed `getScreeningTasks` method.
- Updated `arePhaseDependenciesMet()` and `canPhaseStart()` methods to return `OperationCheckResult` instead of simply boolean value.

1.5 Component Exception Definitions

ConfigurationException

Represents an exception related to loading configuration settings. Inner exception should be provided to give more details about the error. It is used in PhaseHandler implementation classes.

Changes in 1.6.1:

- Extends `BaseCriticalException` instead of `BaseException`
- Added new constructors to meet TopCoder standards

PhaseNotSupportedException

This exception is thrown by a phase handler when the input phase is not the type the handler can handle. It is used in phase handler classes.

Changes in 1.6.1:

- Added new constructors to meet TopCoder standards

1.6 Thread Safety

This design is thread safe. Methods in lookup classes are marked as synchronized for thread safety access to the underlying map. Phase handler classes in this component are immutable so they are thread-safe by default. The manager components used in this component are not thread-safe. But since they are used in this component in a single thread manner in a helper class and phase handlers, this should not be a problem.

Thread safety of this component was not changed in the version 1.6.1.

2. Environment Requirements

2.1 Environment

Development language: Java 1.5

Compile target: Java 1.5, Java 1.6

QA Environment: RedHat Linux 4, Windows 2000, Windows 2003

2.2 TopCoder Software Components

- Configuration Manager 2.2 – used to read the configuration information.
- DB Connection Factory 1.1 – used to create the connection to the database.
- Base Exception 2.0 – used as the base for all custom exception classes.
- Email Engine 3.2 – used to send email
- Document Generator 3.1.1 - used to generate email template.
- Logging Wrapper 1.2 – used to log in selective classes
- Phase Management 1.1 – used to search for phases
- Review Management 1.0 – used to search for reviews
- Resource Management 1.1.1 – used to search for resources.
- Project Management 1.2 – used to search for projects.

- Scorecard Management 1.0.1 – used to search for scorecards.
- Deliverable Management 1.2 – used to search for uploaded deliverables
- Review Score Aggregator 1.0 – Used to aggregate review scores
- Search Builder 1.3.1 – used to perform filter-based searches
- ID Generator 3.0 – used to generate unique IDs
- Data Validation 1.1.1 – used to validate string and long values
- Scorecard Data Structure 1.0 – defines scorecard entities
- Review Data Structure 1.0 – defines review entities
- Project Phases 2.0 – defines project phase entities
- User Project Data Store 1.0.1 – defines ExternalUser and UserRetrieval

2.3 Third Party Components

- None

3. Installation and Configuration

3.1 Package Name

com.cronos.onlinereview.phases
com.cronos.onlinereview.phases.lookup
com.cronos.onlinereview.phases.logging

3.2 Configuration Parameters

For a phase handler class:

(Note that \$schemeName is place holder for actual scheme for role names)

(Similarly, xx is to be replaced with either start or end)

Parameter	Description	More information
ConnectionFactoryNS	The namespace that contains settings for DB Connection Factory.	String – Required
ConnectionName	The name of the connection that will be used by DBConnectionFactory to create connection. If missing, default connection will be created.	String - Optional
ManagerHelperNamespace	The namespace that will be used by ManagerHelper class. If missing, default namespace of this class will be used.	String - Optional
Schemes	Property, contains all the supported schemes to send out the email	List of Child property, whose name attribute are the desired scheme name. For example <pre><Property name="Schemes"> <Property name="DefaultScheme"> <Value>Manager</Value> <Value>Reviewer</Value> <Value>Observer</Value> </Property> ...</pre>

		</Property>
Schemes/[schemeName]	Property, contains all the resource role names for the given scheme.	List of String values, which are the resource role names. "*" can be used to match every role name in persistence.
[\$schemeName]/xxPhaseEmail / EmailTemplateName	Contains the template name settings for start or end phase email for the particular roles.	String – Required
[\$schemeName]/xxPhaseEmail / EmailSubject	Settings for the email subject for start or end phase email for the particular roles.	String – Optional
[\$schemeName]/xxPhaseEmail / EmailFromAddress	Settings for the from email address for start or end phase email for the particular roles.	String – Required
[\$schemeName]/xxPhaseEmail/SendEmail	If it is specified, email will be sent for the particular role. If missing, email will not be sent for the particular role.	String - Optional
[\$schemeName]/xxPhaseEmail/Priority	The priority for email options for this roles. If not set, default is 0.	Integer – Optional

For a ManagerHelper class:

Parameter	Description	More information
ProjectManager.ClassName	The full class name of the ProjectManager implementation.	String – Required
ProjectManager.Namespace	The configuration namespace to initialize the ProjectManager instance. If missing the default constructor is used to create the instance.	String – Optional
ProjectLinkManager.ClassName	The full class name of the ProjectLinkManager implementation.	String – Required
ProjectLinkManager.Namespace	The configuration namespace to initialize the ProjectLinkManager instance. If missing the default constructor is used to create the instance.	String – Optional
ScorecardManager.ClassName	The full class name of the ScorecardManager implementation.	String – Required
ScorecardManager.Namespace	The configuration namespace to initialize the ScorecardManager instance. If missing the default constructor is used to create the instance.	String – Optional
ReviewManager.ClassName	The full class name of the ReviewManager implementation.	String – Required
ReviewManager.Namespace	The configuration namespace to initialize the ReviewManager instance. If missing the default	String – Optional

	constructor is used to create the instance.	
UploadManager.ClassName	The full class name of the UploadManager implementation.	String – Required
UploadManager.UploadSearchBundleName	The SearchBundle name used to search for uploads.	String – Required
UploadManager.SubmissionSearchBundleName	The SearchBundle name used to search for submissions.	String – Required
UploadManager.UploadIdGeneratorName	The name to load IDGenerator for uploads.	String – Required
UploadManager.UploadTypeIdGeneratorName	The name to load IDGenerator for upload types.	String – Required
UploadManager.UploadStatusIdGeneratorName	The name to load IDGenerator for upload statuses.	String – Required
UploadManager.SubmissionIdGeneratorName	The name to load IDGenerator for submissions.	String – Required
UploadManager.SubmissionStatusIdGeneratorName	The name to load IDGenerator for submission statuses.	String – Required
UploadManager.PersistenceClassName	The name of the UploadPersistence implementation	String – Required
ResourceManager.ClassName	The full class name of the ResourceManager implementation.	String – Required
ResourceManager.ResourceSearchBundleName	The SearchBundle name used to search for resources.	String – Required
ResourceManager.ResourceRoleSearchBundleName	The SearchBundle name used to search for resource roles.	String – Required
ResourceManager.NotificationSearchBundleName	The SearchBundle name used to search for notifications.	String – Required
ResourceManager.NotificationTypeSearchBundleName	The SearchBundle name used to search for notification types.	String – Required
ResourceManager.ResourceIdGeneratorName	The name to load IDGenerator for resources.	String – Required
ResourceManager.NotificationTypeIdGeneratorName	The name to load IDGenerator for notifications.	String – Required
ResourceManager.ResourceRoleIdGeneratorName	The name to load IDGenerator for resource roles.	String – Required
ResourceManager.PersistenceClassName	The name of ResourcePersistence implementation	String – Required
PhaseManager.ClassName	The full class name of the PhaseManager implementation.	String – Required
PhaseManager.Namespace	The configuration namespace to initialize the PhaseManager instance. If missing the default constructor is used to create the instance.	String – Optional
ConnectionFactoryNS	Namespace for db connection factory	String – Required
ConnectionName	connection name.	String – Optional. If missing default connection is used.
SearchBundleManagerNS	namespace for search bundle manager	String – Required

UserProjectDataStore. UserRetrievalClassName	The full class name of the UserRetrieval implementation.	String – Required
UserProjectDataStore. UserRetrievalNamespace	The configuration namespace to initialize the UserRetrieval instance. If missing the default constructor is used to create the instance.	String – Optional
ScorecardAggregator. Namespace	The configuration namespace to initialize the ReviewScoreAggregator instance.	String – Required
ProjectRoleTermsOfUseClassName	The full class name of the ProjectRoleTermsOfUse implementation	String - Required
UserTermsOfUseClassName	The full class name of the UserTermsOfUse implementation	String - Required

3.3 Dependencies Configuration

The connection definitions in DB Connection Factory need to be configured. See the spec of the DB Connection Factory component for details.

4. Usage Notes

4.1 Required steps to test the component

- Extract the component distribution.
- Follow [Dependencies Configuration](#).
- Execute 'ant test' within the directory that the distribution was extracted to.

4.2 Required steps to use the component

Load the configuration before using this component.

See sample configuration in Phase_handler.xml file for details.

4.3 Demo

This component is used by Phase Management component. The implementation of the interface PhaseManager will call phase handlers' methods.

In PhaseManager#canStart() method:

PhaseHandler#canPerform() method is called to check if a phase can start.

The passed phase instance status should be 'Scheduled'

In PhaseManager#canEnd() method:

PhaseHandler#canPerform() method is called to check if a phase can end.

The passed phase instance status should be 'Open'

In PhaseManager#start() method:

PhaseHandler#perform() method is called to provide additional starting logic.

The passed phase instance status should be 'Scheduled'

In PhaseManager#end() method:

PhaseHandler#perform() method is called to provide additional ending logic.

The passed phase instance status should be 'Open'

PhaseManager implementations also have to provide a mechanism let user to configure each phase type with the corresponding phase handler.

Below is the code which can be used for this demo.

```

//init the phase management component.
PhaseManager phaseManager = new
DefaultPhaseManager("com.topcoder.management.phase.DefaultPhaseManager");

//init the phase handler class.
PhaseHandler phaseHandler = new ScreeningPhaseHandler
(ScreeningPhaseHandler.DEFAULT_NAMESPACE);

// register a phase handler for dealing with canStart() and canEnd()
PhaseType phaseType = new PhaseType(3, "Screening");
phaseManager.registerHandler(phaseHandler, phaseType,
PhaseOperationEnum.START);
phaseManager.registerHandler(phaseHandler, phaseType,
PhaseOperationEnum.END);

//get the phase instance.
cleanupPhases();
Project project = setupPhases();
Phase[] phases = project.getAllPhases();
Phase phase = phases[2];

//prepare data

//canStart method will call canPerform() and perform() methods of the
phaseHandler.
OperationCheckResult checkResult = phaseManager.canStart(phase);

if (checkResult.isSuccess()) {
    phaseManager.start(phase, "1001");
} else {
    // print out a reason why phase cannot be started
    System.out.println(checkResult.getMessage());
    // Explanation can be one of the following for Screening phase:
    // "Dependency Submission phase is not yet ended"
    // "Phase start time is not yet reached"
    // "Contest has no submissions"
    return;
}

//prepare data

//canEnd method will call canPerform() and perform() methods of the
phaseHandler
checkResult = phaseManager.canEnd(phase);

if (checkResult.isSuccess()) {
    phaseManager.end(phase, "1001");
} else {
    // print out a reason why phase cannot be started
    System.out.println(checkResult.getMessage());
    // Explanation can be one of the following for Screening phase:
    // "Not all primary screening scorecards are committed
    //     (see submission with ID=123)"
    // "Individual screening scorecard is not committed"
    return;
}

```

For 1.2 version, there is no specific demo needed since the API is the same, just the internal of it is a bit different.

Here is a customer scenario describing the difference.

Consider the case where for the end of the screening phase, user babut (a manager) is configured to be sent out email with template A.

Also, babut is an observer of this project and configured to be sent our email with template_observer. (But since the observer priority is lower than Manager, so only one email will be sent in template A format).

Whereas, user prunthaban/ fastprogrammer (submitters) are configured to be sent out email with template B.

```
// let assume phase is screening phase
phaseManager.end(phase, "1001");
```

The user babut is sent out a mail with template A.

The user prunthaban/ fastprogrammer are sent out a mail with template B.

This is the email received by user babut:

Wed, Nov 18, 2009 12:50 PM EST

Hello The babut guy,

Handle: babut

This is the notification on project: Online Review Phases

OR link:

<http://software.topcoder.com/review/actions/ViewProjectDetails.do?method=viewProjectDetails&pid=30007860>

Version: 1.1

This is the end of the Screening phase.

Screening results:

Handle	Score	Result
prunthaban	90.0	Pass Screening
fastprogrammer	70.0	Failed Screening

This is the email received by prunthaban(fastprogrammer's is similar):

Wed, Nov 18, 2009 12:50 PM EST

Hello Allen Ivern,

Handle: prunthaban

This is the notification on project: Online Review Phases

OR link:

<http://software.topcoder.com/review/actions/ViewProjectDetails.do?method=viewProjectDetails&pid=30007860>

Version: 1.1

This is the end of the Screening phase.

For 1.4 version, two new handlers added,

SpecificationSubmissionPhaseHandler and SpecificationReviewPhaseHandler.

Sample usage of SpecificationReviewPhaseHandler:

```

SpecificationReviewPhaseHandler handler = new
SpecificationReviewPhaseHandler(PHASE_HANDLER_NAMESPACE);

Project project = setupPhasesForSpec(true);
Phase[] phases = project.getAllPhases();
phases[0].setPhaseStatus(PhaseStatus.CLOSED);

Phase phase = phases[1];
phase.setPhaseStatus(PhaseStatus.SCHEDULED);

// insert a submission with specification submission type
Connection conn = getConnection();
Resource resource = createResource(4, 101L, 1, 17);
insertResources(conn, new Resource[] {resource});
Upload upload = createUpload(1, project.getId(), 4, 1, 1, "parameter");
insertUploads(conn, new Upload[] {upload});

Submission submission = createSubmission(1, upload.getId(), 1, 2);
insertSubmissions(conn, new Submission[] {submission});
// it now can perform start
If (handler.canPerform(phase).isSuccess()) {
    // start
    handler.perform(phase, "1001");
}
// we will close the phase now
// create a reviewer
Resource reviewer = createResource(5, 102L, 1, 15);
insertResources(conn, new Resource[] {reviewer});
insertResourceInfo(conn, reviewer.getId(), 1, "3");
Scorecard scorecard = createScorecard(1, 1, 2, 6, "name", "1.0", 75.0f,
100.0f);
    Review review = createReview(11, 5, 1, 1, true, 90.0f);
// add a rejected comment
review.addComment(createComment(1111, reviewer.getId(), "Approved", 14,
"Specification Review Comment"));
insertScorecards(conn, new Scorecard[] {scorecard});
insertReviews(conn, new Review[] {review});
insertCommentsWithExtraInfo(conn, new long[] {1}, new long[]
{reviewer.getId()}, new long[] {review.getId()}, new String[] {"Approved
Comment"}, new long[] {14}, new String[] {"Approved"});
// change the phase status to open
phase.setPhaseStatus(PhaseStatus.OPEN);
// we can stop the phase now
If (handler.canPerform(phase).isSuccess()) {
    // stop the phase
    handler.perform(phase, "1001");
}

```

Sample usage of SpecificationSubmissionPhaseHandler:

```

SpecificationSubmissionPhaseHandler handler = new
SpecificationSubmissionPhaseHandler(PHASE_HANDLER_NAMESPACE);
Project project = setupPhasesForSpec(true);
Phase[] phases = project.getAllPhases();
Phase phase = phases[0];

```

```

// set with scheduled status.
phase.setPhaseStatus(PhaseStatus.SCHEDULED);
// phase can be start now
If (handler.canPerform(phase).isSuccess()) {
    // start the phase
    handler.perform(phase, "operator");
}
// we will stop the phase now
// set with open status.
phase.setPhaseStatus(PhaseStatus.OPEN);
Resource reviewer = createResource(1, 102L, 1, 15);
insertResources(conn, new Resource[] {reviewer});
insertResourceInfo(conn, reviewer.getId(), 1, "3");

// create a registration
Resource resource = createResource(4, 101L, 1, 17);
insertResources(conn, new Resource[] {resource});
insertResourceInfo(conn, resource.getId(), 1, "4");

// insert upload/submission
Upload upload = createUpload(1, project.getId(), 1, 1, 1, "parameter");
insertUploads(conn, new Upload[] {upload});
Submission submission = createSubmission(1, upload.getId(), 1, 2);
insertSubmissions(conn, new Submission[] {submission});
// we can stop the phase
If (handler.canPerform(phase).isSuccess()) {
    // stop it now
    handler.perform(phase, "operator");
}

```

Please see sample email templates for new SpecificationSubmissionPhaseHandler and SpecificationReviewPhaseHandler phases in the "email templates" folder provided together with this specification.

For 1.6 version, three new handlers added, MilestoneSubmissionPhaseHandler, MilestoneScreeningPhaseHandler and MilestoneReviewPhaseHandler.

Notes, the specific values will be changed according to the database definition for new types.

Sample usage of MilestoneSubmissionPhaseHandler:

```

MilestoneSubmissionPhaseHandler handler = new
    MilestoneSubmissionPhaseHandler(PHASE_HANDLER_NAMESPACE);
Project project = setupPhases();
Phase[] phases = project.getAllPhases();

// assume the 14th phase is milestone submission phase.
Phase phase = phases[13];

// set with scheduled status.
phase.setPhaseStatus(PhaseStatus.SCHEDULED);
// phase can be start now
If (handler.canPerform(phase).isSuccess()) {

```

```

        // start the phase
        handler.perform(phase, "operator");
    }
    // we will stop the phase now
    // set with open status.
    phase.setPhaseStatus(PhaseStatus.OPEN);
    Resource screener = createResource(1, 102L, 1, 20);
    insertResources(conn, new Resource[] { screener});
    insertResourceInfo(conn, screener.getId(), 1, "3");

    // create a registration
    Resource resource = createResource(4, 101L, 1, 19);
    insertResources(conn, new Resource[] {resource});
    insertResourceInfo(conn, resource.getId(), 1, "4");

    // insert a submission with milestone submission type
    Upload upload = createUpload(1, project.getId(), 1, 1, 1, "parameter");
    insertUploads(conn, new Upload[] {upload});
    // assume the milestone submission type id is 3.
    Submission submission = createSubmission(1, upload.getId(), 1, 3);
    insertSubmissions(conn, new Submission[] {submission});
    // we can stop the phase
    If (handler.canPerform(phase).isSuccess()) {
        // stop it now
        handler.perform(phase, "operator");
    }
}

```

Sample usage of MilestoneScreeningPhaseHandler:

```

MilestoneScreeningPhaseHandler handler = new
MilestoneScreeningPhaseHandler(PHASE_HANDLER_NAMESPACE);

Project project = setupPhases();
Phase[] phases = project.getAllPhases();

// assume following positions are the desired phases.
Phase submissionPhase = phases[13];
Phase screeningPhase = phases[14];
submissionPhase.setPhaseStatus(PhaseStatus.CLOSED);
screeningPhase.setPhaseStatus(PhaseStatus.SCHEDULED);

// insert a submission with milestone submission type
Connection conn = getConnection();
Resource resource = createResource(4, 101L, 1, 19);
insertResources(conn, new Resource[] {resource});
Upload upload = createUpload(1, project.getId(), 4, 1, 1, "parameter");
insertUploads(conn, new Upload[] {upload});

// assume the milestone submission type id is 3.
Submission submission = createSubmission(1, upload.getId(), 1, 3);
insertSubmissions(conn, new Submission[] {submission});
// it now can perform start
if (handler.canPerform(screeningPhase).isSuccess()) {
    // start
    handler.perform(screeningPhase, "1001");
}
// we will close the phase now

```

```

// create a milestone screener
Resource screener = createResource(5, 102L, 1, 20);
insertResources(conn, new Resource[] {screener});
insertResourceInfo(conn, screener.getId(), 1, "3");
Scorecard scorecard = createScorecard(1, 1, 2, 6, "name", "1.0", 75.0f,
100.0f);
Review review = createReview(11, 5, 1, 1, true, 90.0f);
insertScorecards(conn, new Scorecard[] {scorecard});
insertReviews(conn, new Review[] {review});
// change the phase status to open
phase.setPhaseStatus(PhaseStatus.OPEN);
// we can stop the phase now
if (handler.canPerform(screeningPhase).isSuccess()) {
    // stop the phase
    handler.perform(screeningPhase, "1001");
}

```

Sample usage of MilestoneReviewPhaseHandler:

```

MilestoneReviewPhaseHandler handler = new
MilestoneReviewPhaseHandler(PHASE_HANDLER_NAMESPACE);

Project project = setupPhases();
Phase[] phases = project.getAllPhases();
Phase submissionPhase = phases[13];
Phase reviewPhase = phases[15];

// test with scheduled status.
reviewPhase.setPhaseStatus(PhaseStatus.SCHEDULED);

// time has passed, but dependency not met.
reviewPhase.setActualStartDate(new Date());

// time has passed and dependency met.

reviewPhase.getAllDependencies()[0].getDependency().setPhaseStatus(PhaseStatus.C
LOSED);

// And we set up a active submission in screening phase
Connection conn = getConnection();

Resource submitter = createResource(1, submissionPhase.getId(), 1, 19);

Upload upload = createUpload(1, 1, submitter.getId(), 1, 1, "parameter");
Submission submission = createSubmission(1, 1, 1, 3);

insertResources(conn, new Resource[] {submitter});
insertResourceInfo(conn, submitter.getId(), 1, "11111");
insertUploads(conn, new Upload[] {upload});
insertSubmissions(conn, new Submission[] {submission});

// it now can perform start
if (handler.canPerform(reviewPhase).isSuccess()) {
    // start
    handler.perform(reviewPhase, "1001");
}

```

```

// we will close the phase now
// create a milestone reviewer
Resource reviewer = createResource(6, reviewPhase.getId(), 1, 21);
insertResources(conn, new Resource[] {reviewer});
insertResourceInfo(conn, reviewer.getId(), 1, "2");
// insert scorecard
Scorecard sc = this.createScorecard(1, 1, 2, 1, "name", "1.0", 75.0f,
100.0f);
insertScorecards(conn, new Scorecard[] {sc});
Review review = createReview(1, reviewer.getId(), submission.getId(),
sc.getId(), true, 77.0f);
insertReviews(conn, new Review[] {review});

// change the phase status to open
reviewPhase.setPhaseStatus(PhaseStatus.OPEN);
// we can stop the phase now
if (handler.canPerform(reviewPhase).isSuccess()) {
    // stop the phase
    handler.perform(reviewPhase, "1001");
}

```

Please see sample email templates for new MilestoneSubmissionPhaseHandler, MilestoneScreeningPhaseHandler and MilestoneReviewPhaseHandler phases in the "email templates" folder provided together with this specification.

5. Future Enhancements

Additional phase handlers can be added.
Additional lookup classes can be added.