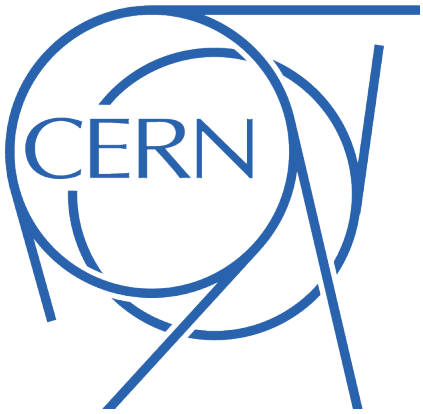

Change Management for CERN

Tasks for GS SE & IS

Process Documentation

Version 0.9
26.09.2011

Table of Contents

1 Document Information

1.1 Version Management

Change	Date	Version	Author
Initial Creation	23.09.2011	0.1	Joachim Baumgart

1.2 Distribution List

1.3 Authors and Collaborators

The following persons were involved in the creation of this document:

- Reinoud Martens CERN GS AIS
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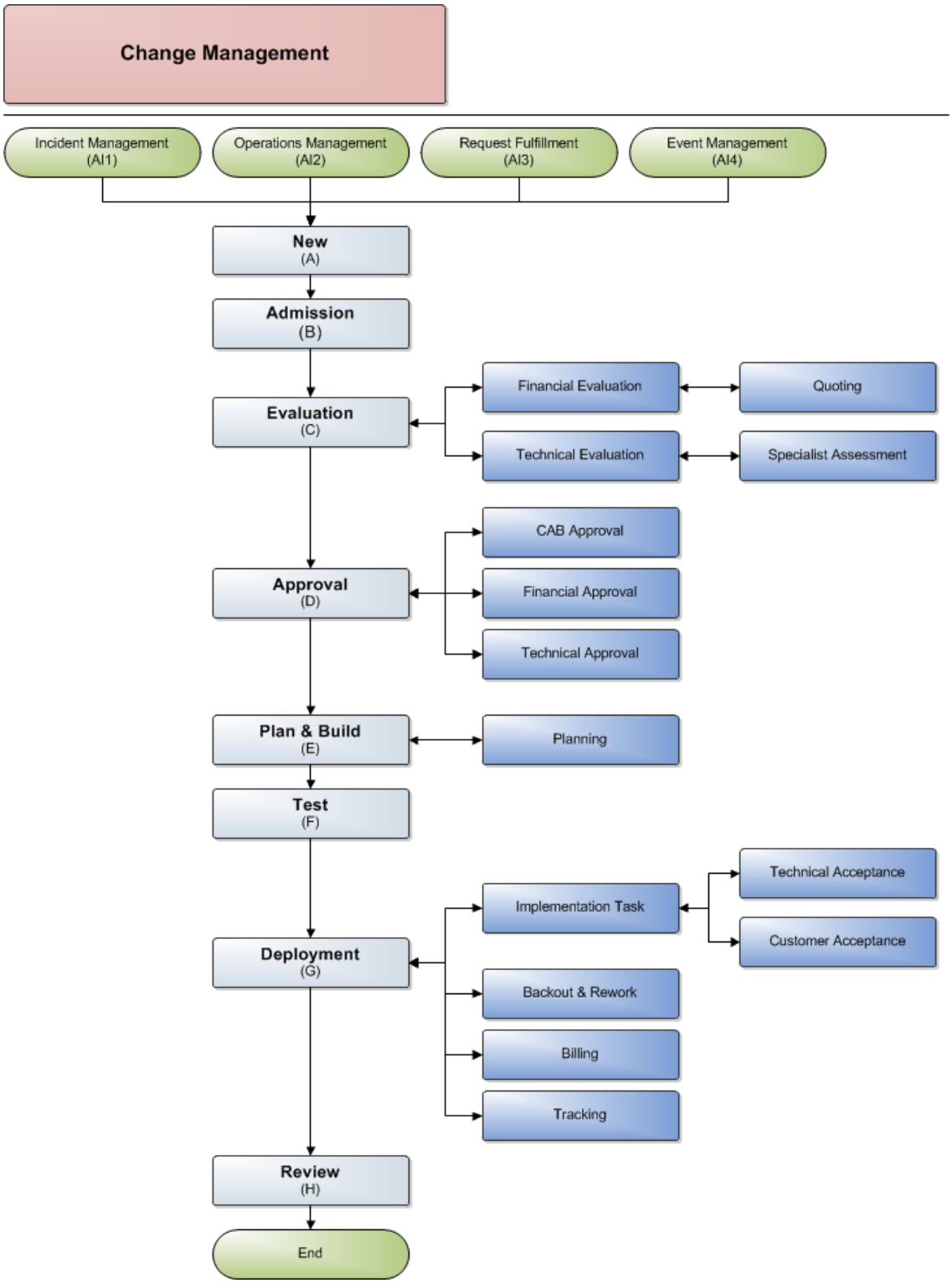
2 Management Summary

The following document is an appendix to the general CERN Change Management documentation and as such only covers subject-matter specific tasks and activities relevant for GS SE/IS.

3 Process Overview



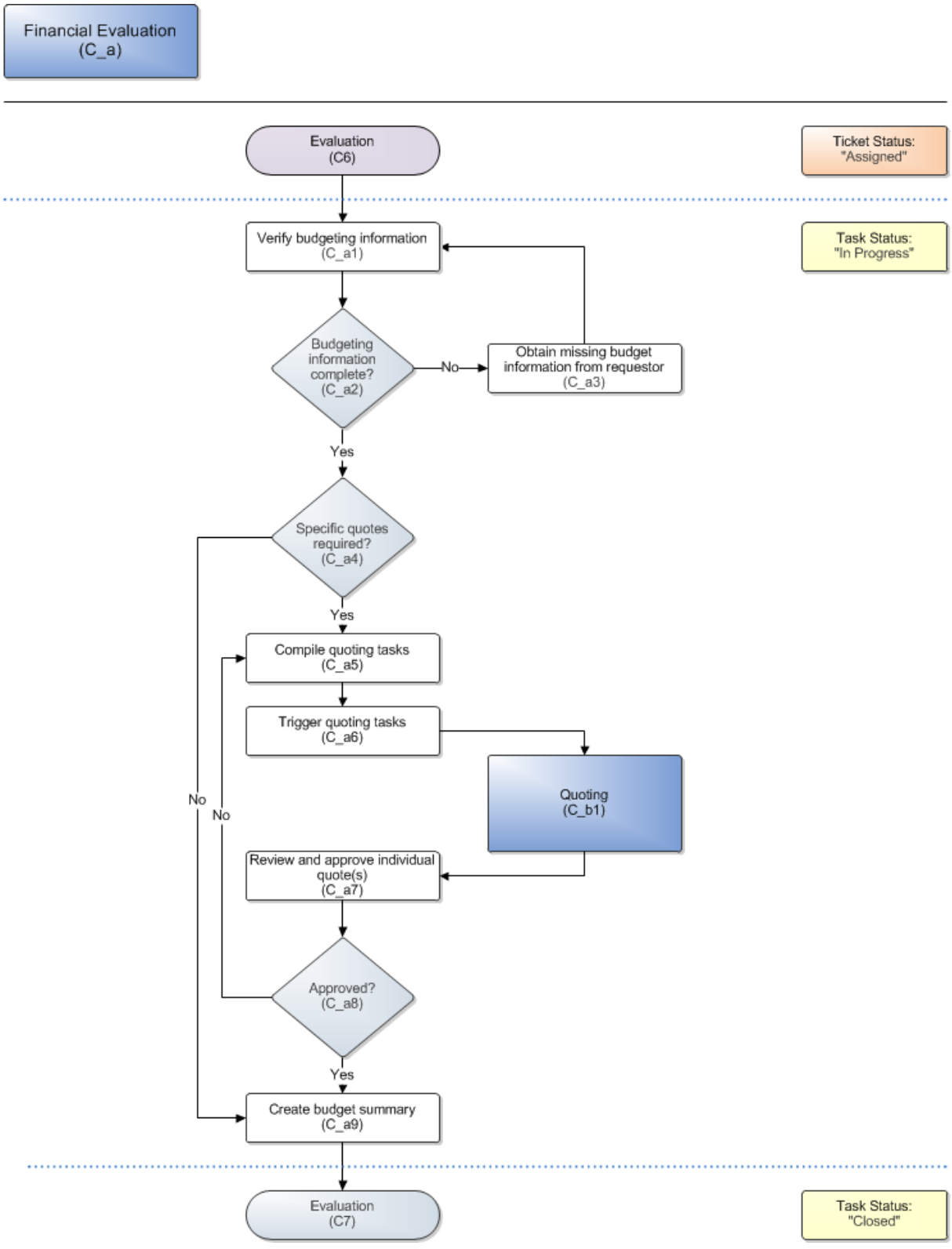
4 Process Tasks

The Change Management process for CERN is based on a modular design centered around a series of generally applicable consecutive stages. This central process path is "reusable" in a multitude of scenarios. To cover specific requirements additional activities and complementary tasks related to areas such as Quoting, Risk Assessment & Management, Tracking of works progress, Billing and general Quality Control & Improvement were defined. These tasks are outlined below:

1. Financial Evaluation (C_a)
   Supporting task for Evaluation to determine whether the request is sensible from a financial point of view
2. Quoting (C_b)
   Optional sub- task for Financial Evaluation to ensure all required quotes are obtained and approved
3. Technical Evaluation (C_c)
   Supporting task for Evaluation to investigate and determine the technical feasibility
4. Specialist Assessment (C_d)
   Optional sub-task to obtain specific approval/acceptance by specialists from areas such as fire & safety, patrimony, locks & keys etc
5. CAB Approval (D_a)
   Review and accept or reject the requested works (general/overall approval)
6. Financial Approval (D_b)
   Review financial information and decide from a financial point of view
7. Technical Approval (D_c)
   Review technical documentation and decide from a technical point of view
8. Planning (E_a)
   Identify work packages and required resources and define a detailed plan
9. Implementation (G_a)
   Execution of actual works, including status monitoring and reporting
10. Technical Acceptance (G_b)
    Verify and test quality of works to ensure technical conformity
11. Customer Acceptance (G_c)
    Review and evaluate quality of works to ensure adherence to customer expectations
12. Backout (G_d)
    Optional deployment in case of unsatisfactory results that require undoing or remedial works.
13. Billing (G_e)
    Handle and control invoices for completed tasks, initiate payments
14. Tracking (G_f)
    Internal monitoring of works progress and status, including the handling and escalation of deviations from plan. This task is useful in particular for large multi-trade requests (projects).

4.1 Financial Evaluation (C_a)

4.1.1 Overview

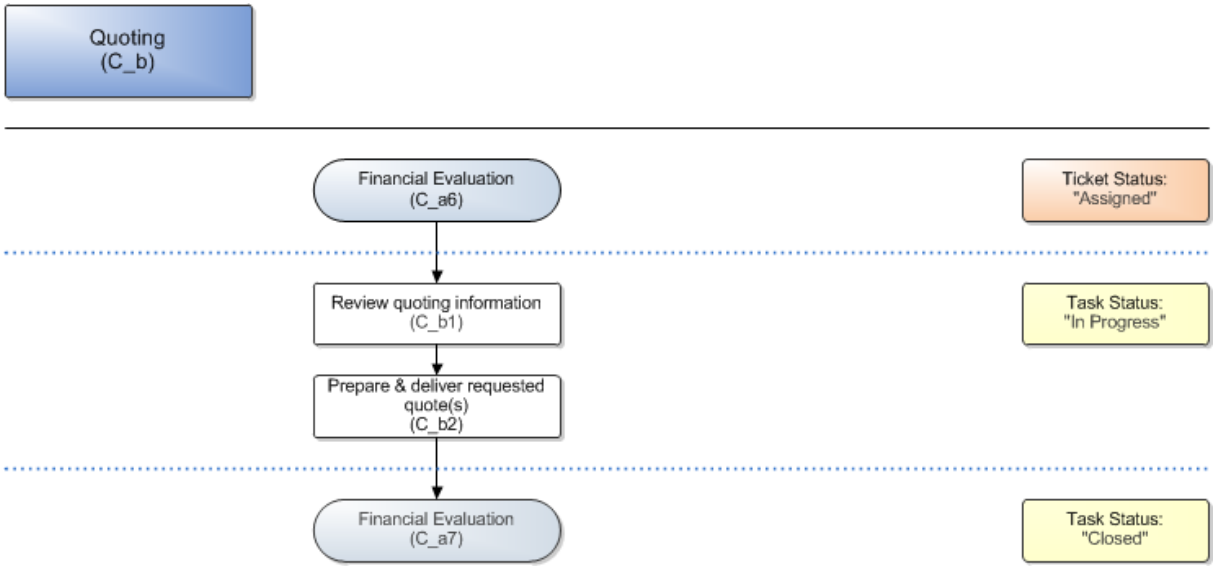


4.1.2 Activity details

ID	Description	In/Out	Tools	Roles
C_a1	The budget-and finance-related information collected during RFC Creation and Admission is reviewed to ensure completeness and consistency.	IN: C6 OUT: C_a2	•	• Controller
C_a2	Based on the review of the available information a decision needs to be made on whether the request can be processed further or whether additional input from the requestor is required.	IN: C_a1 OUT: • Yes = C_a4 • No = C_a3	•	• Controller
C_a3	In case of incomplete or inconsistent data, the requestor is contacted to obtain missing information.	IN: C_a2 OUT: C_a1	•	• Controller
C_a4	Based on the review of the available information a decision needs to be made on whether specific quotes from relevant suppliers and/or contractors are needed.	IN: C_a3 OUT: Yes = C_a5 No = C_a9	•	• Controller
C_a5	If additional quotes are necessary the required quoting tasks are defined. This includes identifying all involved parties and specifying the information required from them.	IN: C_a4, OUT: C_a6	•	• Controller
C_a6	As soon as all quoting tasks have been prepared they are sent to the parties identified in the previous step.	IN: C_a5 OUT: C_b1 (Quoting)	•	• Controller
C_a7	Each returned quote is checked for validity and matched against terms agreed and defined in the Bill of Quantities to identify mistakes, missing information or inconsistencies as quickly as possible.	IN: C_b1 (Quoting) OUT: C_a8	•	• Controller
C_a8	For each quote received a decision needs to be made on whether it is acceptable or whether correction or additional input from the contractor is required. Quotes which do not meet the CERN budgeting requirements or cannot be approved for specific other reasons are returned to the corresponding originator for a re-work.	IN: C_a7 OUT: Yes = C_a9 No = C_a5	•	• Controller
C_a9	As soon as all required individual quotes have been received, reviewed and initially accepted a budget summary is created. The budget summary is returned to the Evaluation stage where it is integrated into the overall request summary which forms the basis for the request approval stage. Information gathered at this stage is a vital input for Finance & Contract Controllers used during the Billing stage to identify and react upon deviations from original quotes can as quickly as possible.	IN: C_a4, C_a8 OUT: C7	•	• Controller

4.2 Quoting (C_b)

4.2.1 Overview

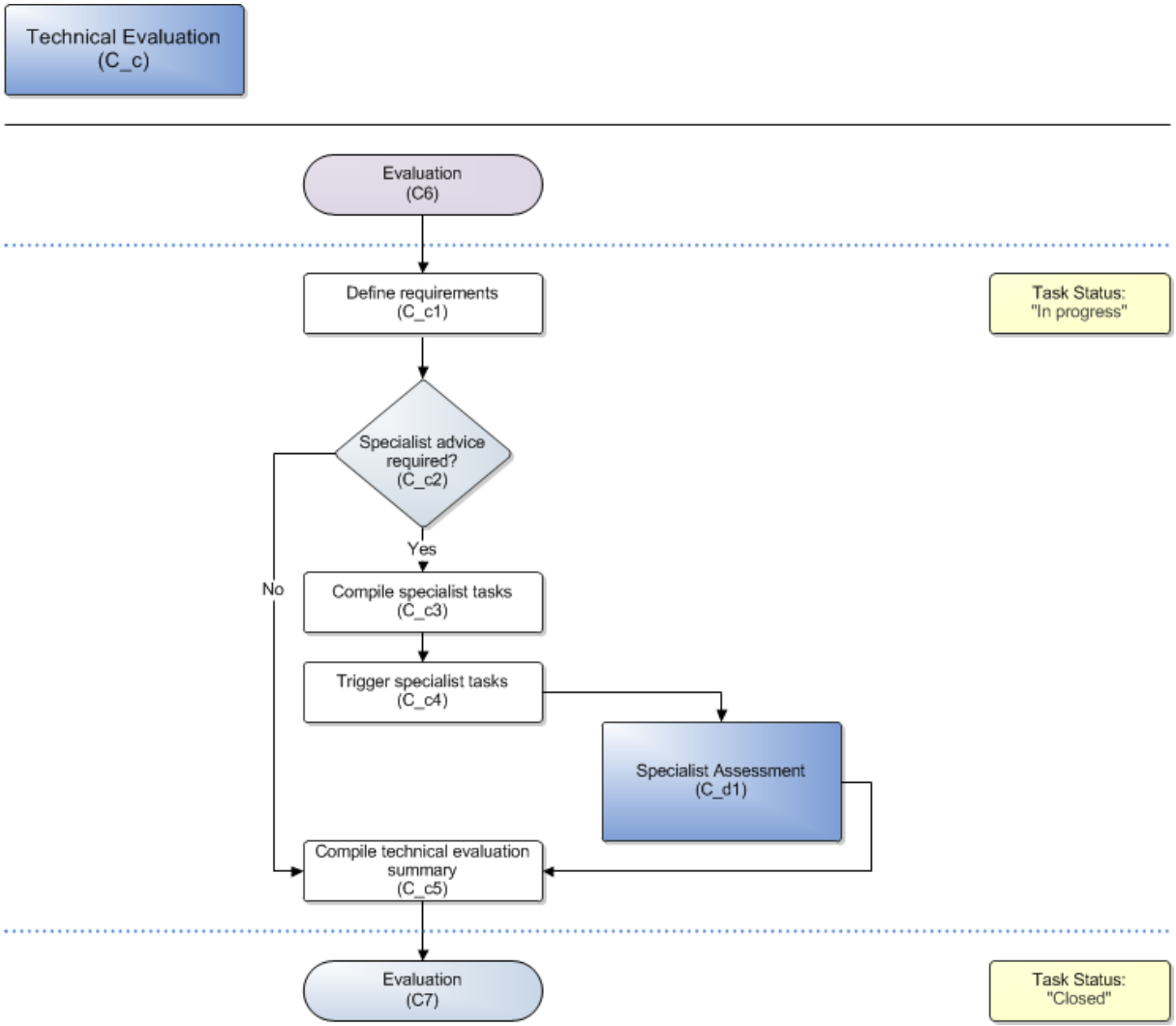


4.2.2 Activity details

ID	Description	In/Out	Tools	Roles
C_b1	Each party addressed to provide a quote needs to review the information sent to them and solve any open issues or uncertain points to ensure there is a correct mutual understanding about what is needed.	IN: C_a6 OUT: C_b2	•	• Change Builder
C_b2	Based on the specification and information provided to them each addressed party creates a quote specifying their estimated or calculated requirements in terms of time, manpower or other chargeable units. As soon as all required information is available a request for order is prepared and sent out to each contractor identified during the impact and resource assessment of the Evaluation stage.	IN: C_b1 OUT: C_a7	•	• Change Builder

4.3 Technical Evaluation (C_c)

4.3.1 Overview

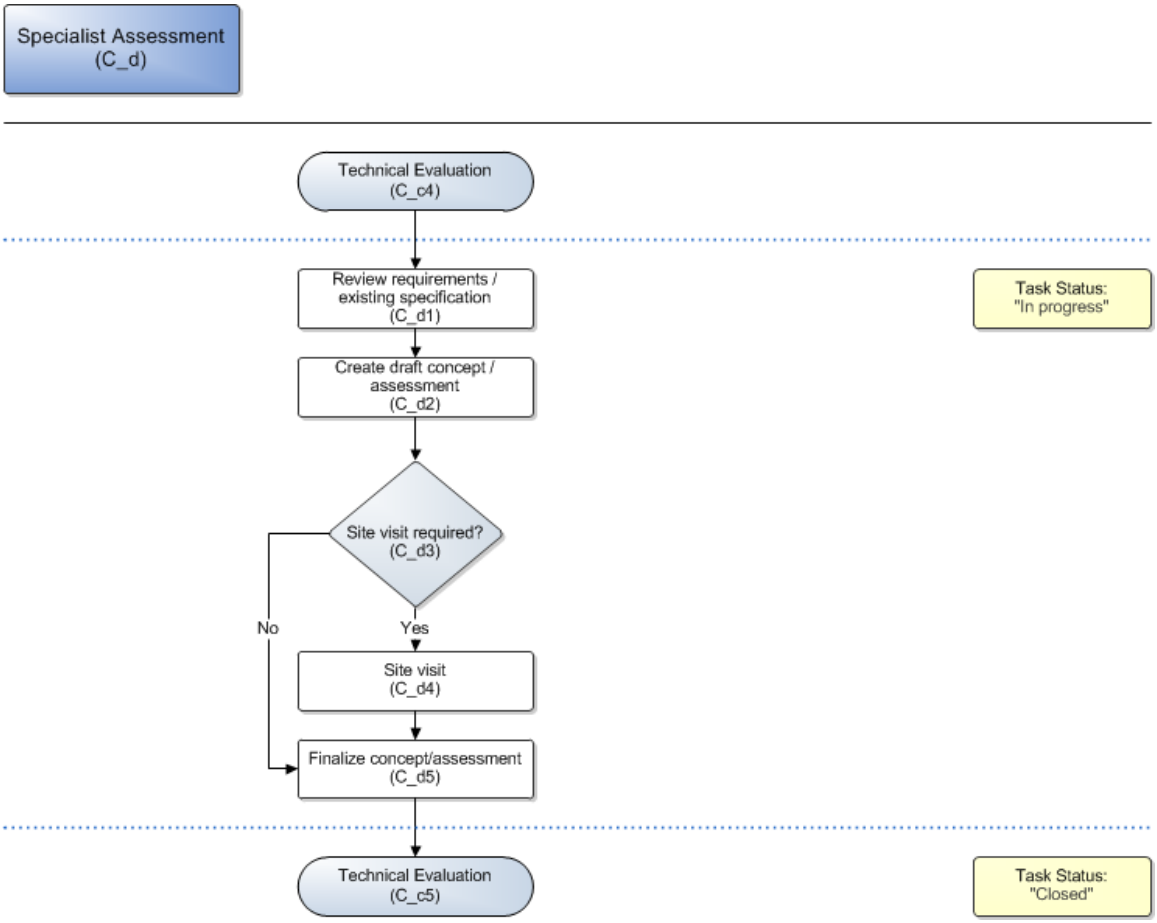


4.3.2 Activity details

ID	Description	In/Out	Tools	Roles
C_c1	Depending on the requirements identified during evaluation the request may need to be assigned to an expert workgroup for further handling. Possible expert input could be obtained from: • Fire & Safety • Patrimony • Locks & Keys • Etc.	IN: C6 OUT: C_c2	•	• Coordinator
C_c2	Based on the reviewed requirements a decision needs to be made on whether additional advice or input is required. Requests which require neither a safety approval nor any additional specialist input should be fit for handling and completed by the corresponding Change Coordinator.	IN: C_c1 OUT: Yes = C_c3 No = C_c5	•	• Coordinator
C_c3	If additional specialist input is required this needs to be obtained by defining the corresponding tasks and assigning them to the specialists identified. Additional specialist input could be obtained from, for example: • Fire & Safety • Ancillary Services • Patrimony • Locks & Keys etc. All requests which require a detailed safety assessment need to be prepared by defining and specifying the necessary safety concept and filling in the corresponding forms (AOC, IS37 etc.).	IN: C_c2 OUT: Yes = C_c4 No = C_c6	•	• Coordinator
C_c4	As soon as all tasks for a specialist assessment have been defined they are sent out to the specialist workgroup(s) for processing.	IN: C_c3 OUT: C_d1	•	• Coordinator
C_c5	All information and/or decisions obtained from additional sources or compiled by the respective Change Coordinator are assembled in a technical evaluation summary to be combined with information from the Financial Evaluation. This full evaluation is used as a basis for decision-making at the Approval stage.	IN: C_c2, C_d5, OUT: C7	•	• Coordinator

4.4 Specialist Assessment (C_d)

4.4.1 Overview

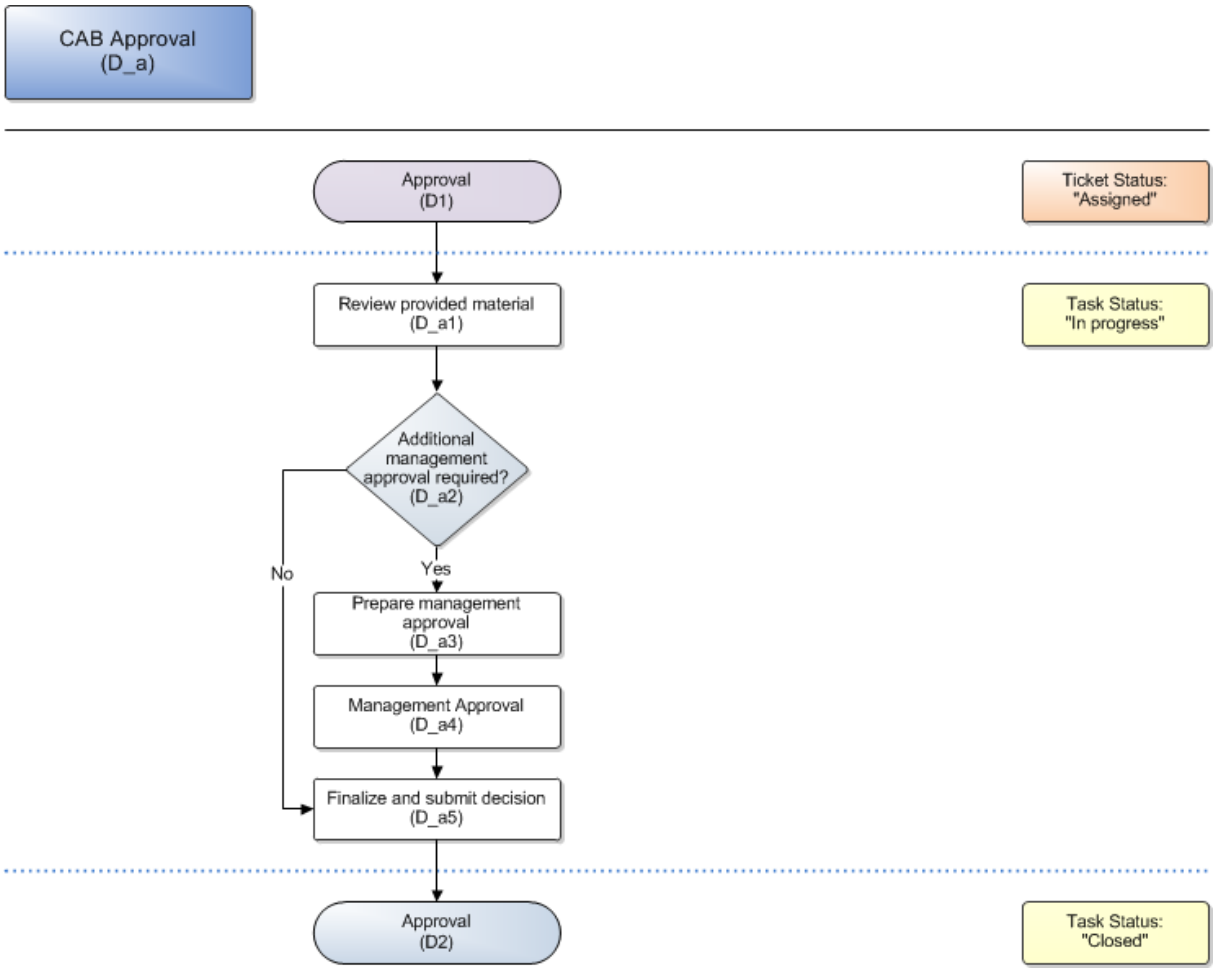


4.4.2 Activity details

ID	Description	In/Out	Tools	Roles
C_d1	All available information, including specifications defined so far, is reviewed to determine the actual requirements.	IN: C_c2 OUT: C_d2	•	• Expert
C_d2	Based on the prior review an initial draft concept/evaluation is created using input from various areas as well as support from CERN standards and other standard specifications such as AOC, IS37 etc.	IN: C_d1 OUT: C_d3	•	• Expert
C_d3	Based on the scope, complexity and the level of risks associated with the requested works a decision needs to be made to determine whether a site visit is necessary to complete the required evaluation/specification.	IN: C_d2 OUT: Yes = C_d4 No = C_d5	•	• Expert
C_d4	If a site visit is found to be necessary the required stakeholders need to be invited and an on-site visit needs to be organized and carried out.	IN: C_d3 OUT: C_d5	•	• Expert
C_d5	Using, where necessary, revised or updated information from the site visit, the evaluation/specification is finalized to ensure adherence to and compliance with all CERN regulations in terms of safety and security as well as all other relevant guidelines and policies.	IN: C_d3, C_d4 OUT: C_c5	•	• Expert

4.5 CAB Approval (D_a)

4.5.1 Overview

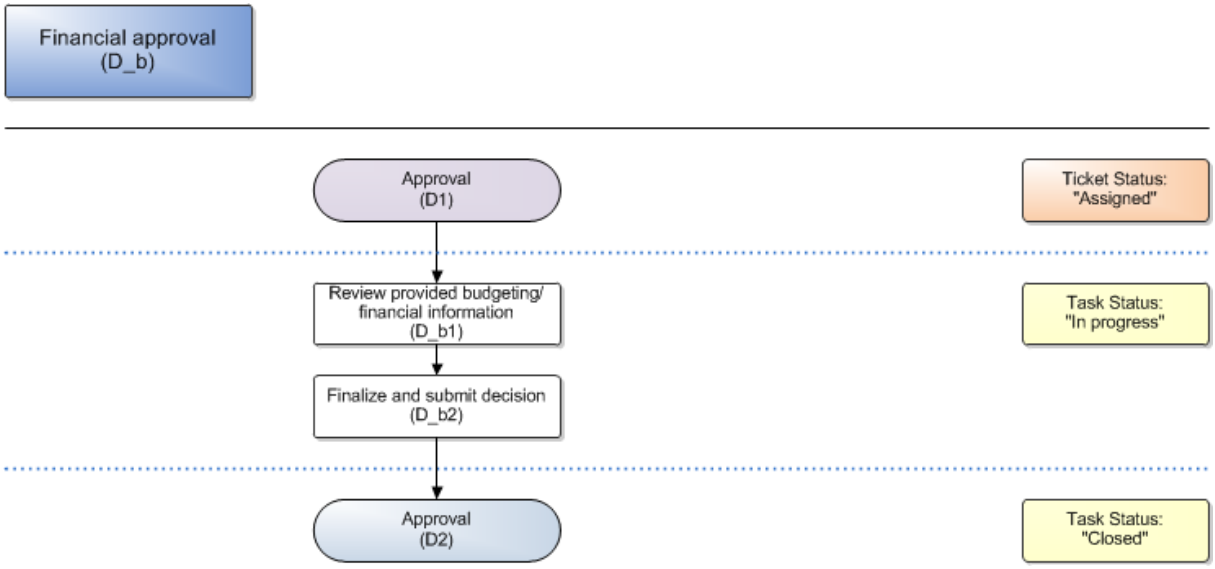


4.5.2 Activity details

ID	Description	In/Out	Tools	Roles
D_a1	The information prepared for the Change Advisory Board meeting is reviewed to prepare the approval. The review includes an evaluation of verdicts from expert assessments, financial information, planning and scheduling information etc.	IN: D1 OUT: D_a2	•	• CAB
D_a2	Based on the review results from the previous step and general CERN approval requirements a decision needs to be made on whether additional hierarchical approval (management approval) needs to be obtained.	IN: D_a1 OUT: Yes = D_a3 No = D_a5	•	• CAB
D_a3	If additional management approval is required the decision making process needs to be prepared by collecting and providing the necessary information in the defined formats to the respective authorities in accordance with CERN regulations.	IN: D_a2 OUT: D_a4	•	• CAB
D-a4	As soon as all relevant information is available it is reviewed by the identified approval authorities and the final verdict is returned for further handling.	IN: D_a3 OUT: D_a5	•	• CAB
D-a5	The actual decision and verdict made either by the CAB itself or by the CAB plus additional authorities is finalized and re-submitted to the overall Approval process stage	IN: D_a2, D_a4 OUT: D2	•	• CAB

4.6 Financial Approval (D_b)

4.6.1 Overview

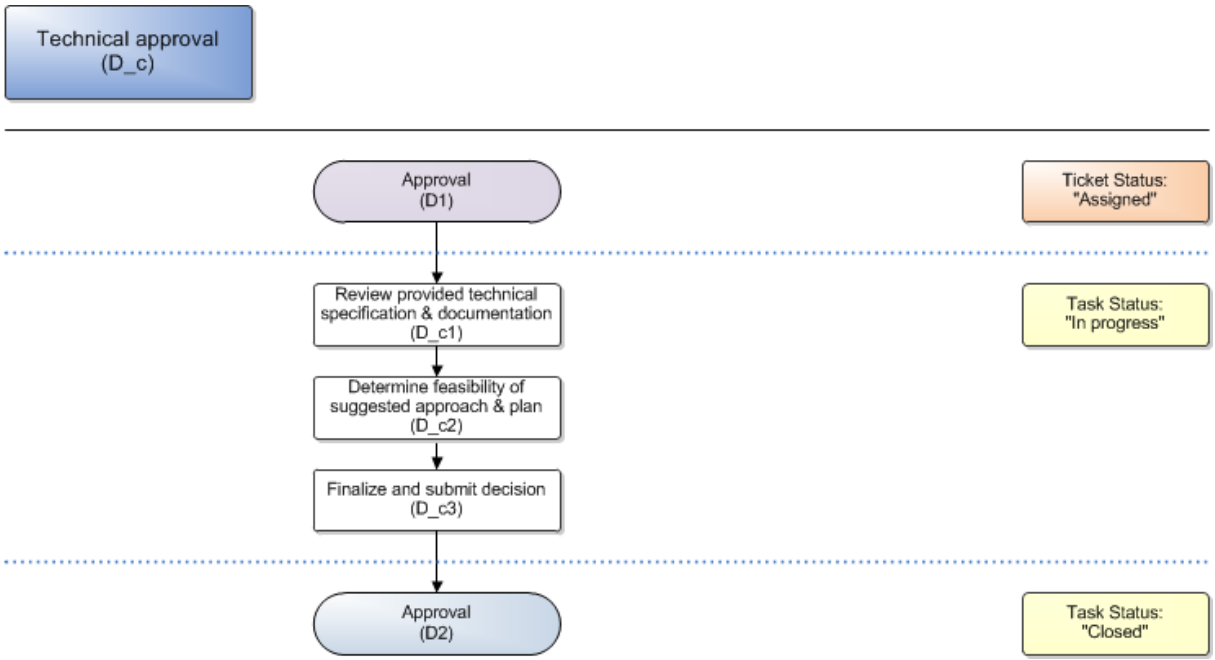


4.6.2 Activity details

ID	Description	In/Out	Tools	Roles
D_b1	The budget owner reviews the information provided first of all in terms of completeness and consistency.	IN: D1 OUT: D_b2	•	• Requestor/ Budget-Owner
D_b2	As soon as all relevant information is available the budget owner reviews and either accepts or rejects the summary quote. The final verdict is sent back to the overall Approval stage and collected with other verdicts made at different stages.	IN: D_b1 OUT: D2	•	• Requestor/ Budget-Owner

4.7 Technical Approval (D_c)

4.7.1 Overview

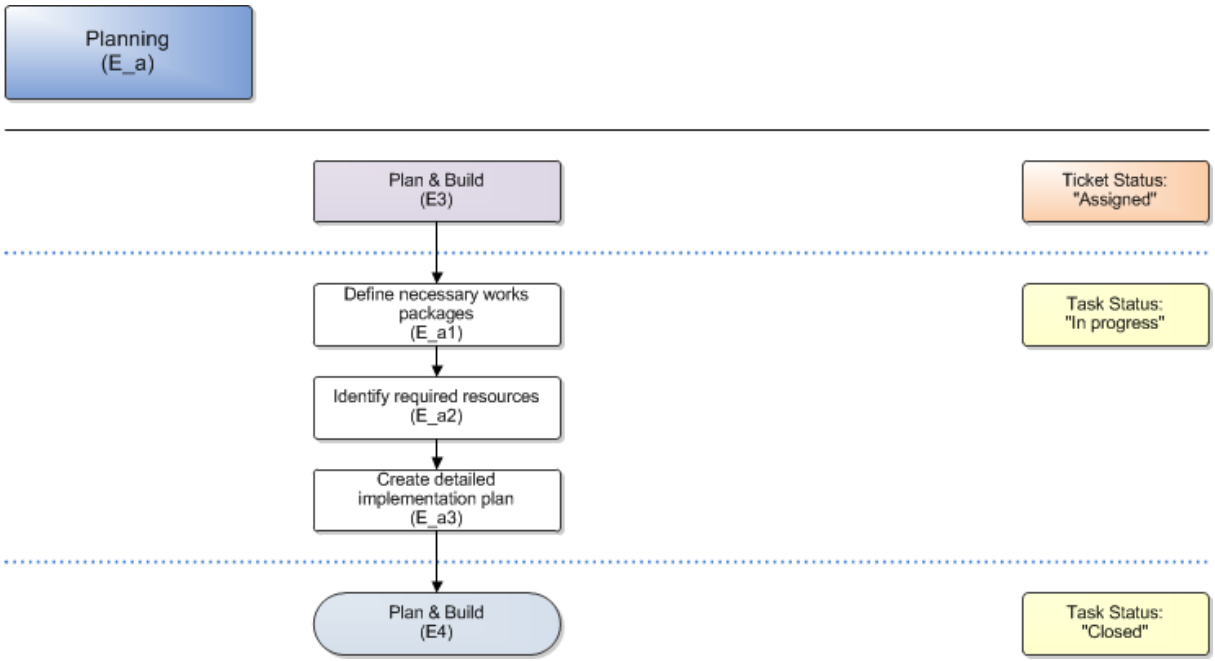


4.7.2 Activity details

ID	Description	In/Out	Tools	Roles
D_c1	The information provided is reviewed first of all in terms of completeness and consistency. Any uncertain or unclear points are sorted out before the next task is started.	IN: D1 OUT: D_c2	•	• Expert
D_c2	As soon as all relevant information is available the specification provided is reviewed in terms of feasibility to ensure that only sensible and actually feasible plans are presented and committed to towards the requestor.	IN: D_c1 OUT: D_c3	•	• Expert
D_c3	Once all questions have been clarified and a final decision has been made this is returned to the overall Approval stage.	IN: D_c2 OUT: D2	•	• Expert

4.8 Planning (E_a)

4.8.1 Overview

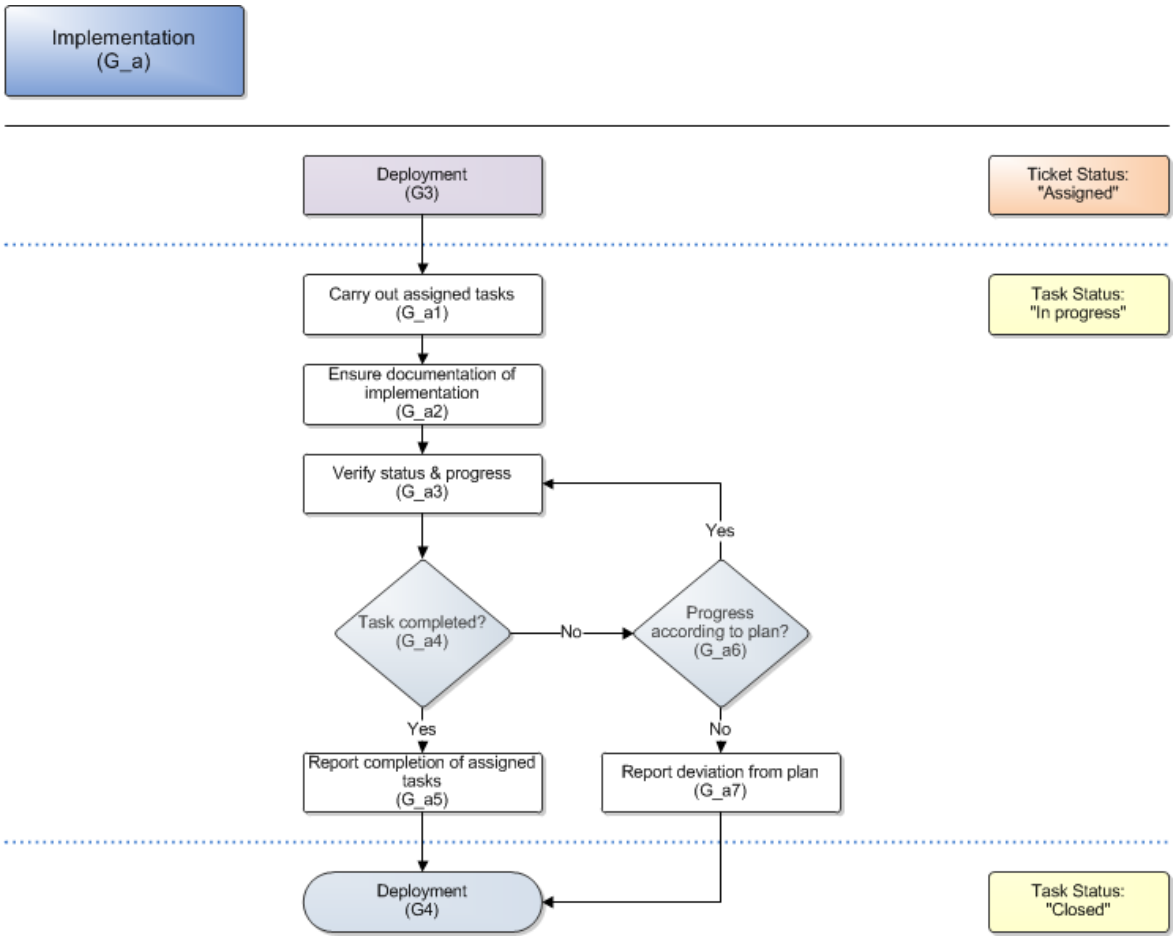


4.8.2 Activity details

ID	Description	In/Out	Tools	Roles
E_a1	Compile the tasks necessary for implementation of the requested works.	IN: E3 OUT: E_a2	•	• Coordinator/ Builder
E_a2	Define the resources necessary for realizing plans and work packages.	IN: E_a1 OUT: E_a3	•	• Coordinator/ Builder
E_a3	Prepare a detailed and comprehensive plan for the correct implementation based on formerly defined information.	IN: E_a2 OUT: E4	•	• Coordinator/ Builder

4.9 Implementation (G_a)

4.9.1 Overview

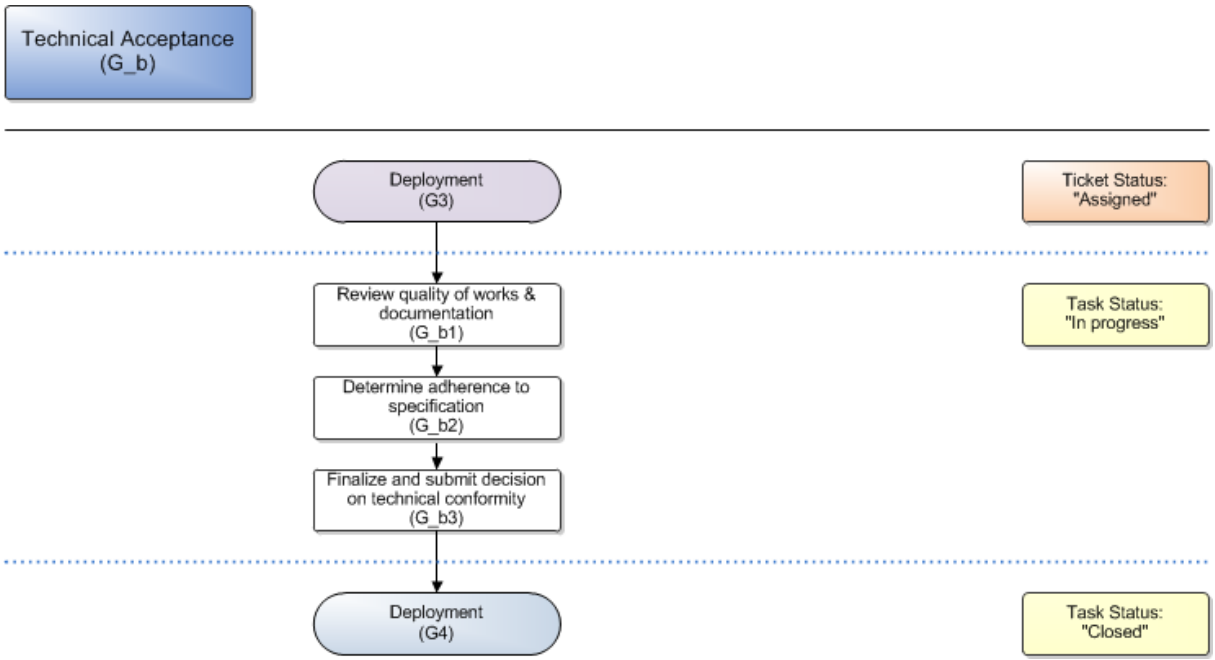


4.9.2 Activity details

ID	Description	In/Out	Tools	Roles
G_a1	Each work package responsible (either internal or external) carries out the tasks assigned to them in accordance with the overall implementation plan.	IN: G3 OUT: G_a2	•	• Builder
G_a2	To complement the actual execution of tasks all works implemented are also documented in accordance with the requirements specified as part of the implementation plan.	IN: G_a1 OUT: G_a3	•	• Builder
G_a3	Each works executor is responsible for ensuring adherence to specification, time and budget by reviewing and reporting the status & progress of works assigned to them (reporting specification frequency defined during planning stage).	IN: G_a2 OUT: G_a4	•	• Builder
G_a4	In particular for multi-trade jobs a distinction needs to be made between completed (closed) and still active (open) tasks)	IN: G_a3 OUT: Yes = G_a5 No = G_a6	•	• Builder
G_a5	As soon as a task or an agreed set of tasks is completed, completion of the task(s) is reported to initiate the Review & Acceptance stage.	IN: G_a4 OUT: G4	•	• Builder
G_a6	Incomplete (active) tasks are reviewed and their status reported to identify deviations from agreed scope and plans asap. Tasks which progress according to plan are simply re-entered into the monitoring and control loop.	IN: G_a4 OUT: Yes = G_a3 No = G_a7	•	• Builder
G_a7	If a deviation from agreed schedule, budget etc. is identified by the works executor this deviation is escalated and discussed with the respective Change Coordinator to determine further action.	IN: G_a6 OUT: G4	•	• Expert

4.10 Technical Acceptance (G_b)

4.10.1 Overview

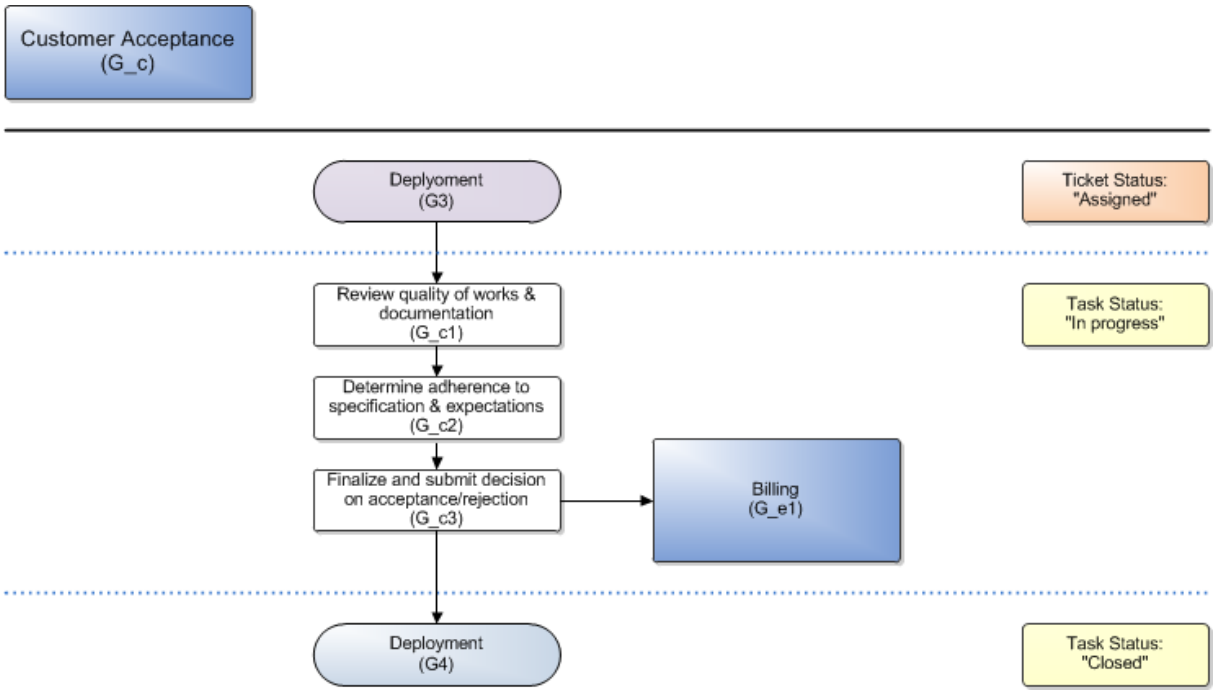


4.10.2 Activity details

ID	Description	In/Out	Tools	Roles
G_b1	The Deployment stage may comprise various different assessments and acceptance activities. In general there are two types of tasks to be considered: • Technical Acceptance • Customer Acceptance To save the customer from having to evaluate works which have failed technical acceptance only requests which have passed technical acceptance should be forwarded to the customer acceptance. This applies in particular to intermediate reviews for partial works Completed tasks and the corresponding documentation are reviewed to determine the quality of workmanship and identify any obvious faults. This stage comprises technical/functional assessments which may go beyond the requestor's capacity/knowledge and require specific expertise.	IN: G3 OUT: G_b2	•	• Expert
G_b2	In addition to the first review stage works delivered are also assessed and compared against the original specification to determine any deviations or cases of non-conformity.	IN: G_b1 OUT: G_b3	•	• Expert
G_b3	Based on the evaluation of works a decision needs to be made on whether the works can be accepted from a technical/functional point of view or whether a non-conformity needs to be filed. This decision is returned to the Change Coordinator for further handling. If the technical review shows inacceptable deviations from the specification a non-conformity is filed to support and ensure the remediation of any deficiencies in accordance with defined policies. In preparation for backout/rework, all incomplete or insufficient works need to be specified and required remediation measures need to be defined to allow for the quickest possible handling and processing.	IN: G_b2 OUT: G4	•	• Expert

4.11 Customer Acceptance (G_c)

4.11.1 Overview

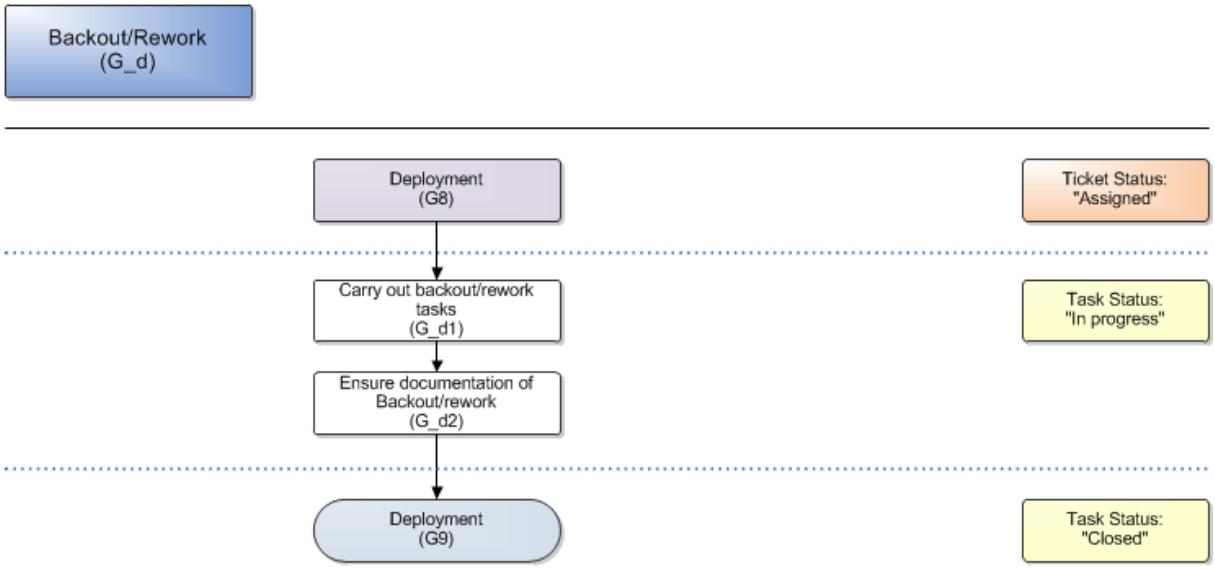


4.11.2 Activity details

ID	Description	In/Out	Tools	Roles
G_c1	Completed tasks and the corresponding documentation are reviewed to determine the quality of workmanship and identify any obvious faults. This stage comprises technical/functional assessments which may go beyond the requestor's capacity/knowledge and require specific expertise.	IN: G3 OUT: G_c2	•	• Requestor
G_c2	In addition to the first review stage works delivered are also assessed and compared against the original specification to determine any deviations or cases of non-conformity. A critical success factor at this stage will be to distinguish between documented hard and fast requirements and undocumented, implicit expectations.	IN: G_c1 OUT: G_c3	•	• Requestor
G_c3	Based on the evaluation of works carried out in the previous steps a decision needs to be made on whether the works can be accepted from a technical/functional point of view or whether a non-conformity needs to be filed. This decision is returned to the Change Coordinator for further handling. If the customer review shows inacceptable deviations from the specification a non-conformity is filed to support and ensure the remediation of any deficiencies in accordance with defined policies. In preparation for backout/rework, all incomplete or insufficient works need to be specified and required remediation measures need to be defined to allow for the quickest possible handling and processing. Depending on the scope and complexity of the job the Customer Acceptance stage can also be used to trigger the Billing task to handle the payment and contractual arrangements necessary for settling invoices with any external partners.	IN: G_c2 OUT: G_e1 (Billing), G4	•	• Requestor

4.12 Backout (G_d)

4.12.1 Overview

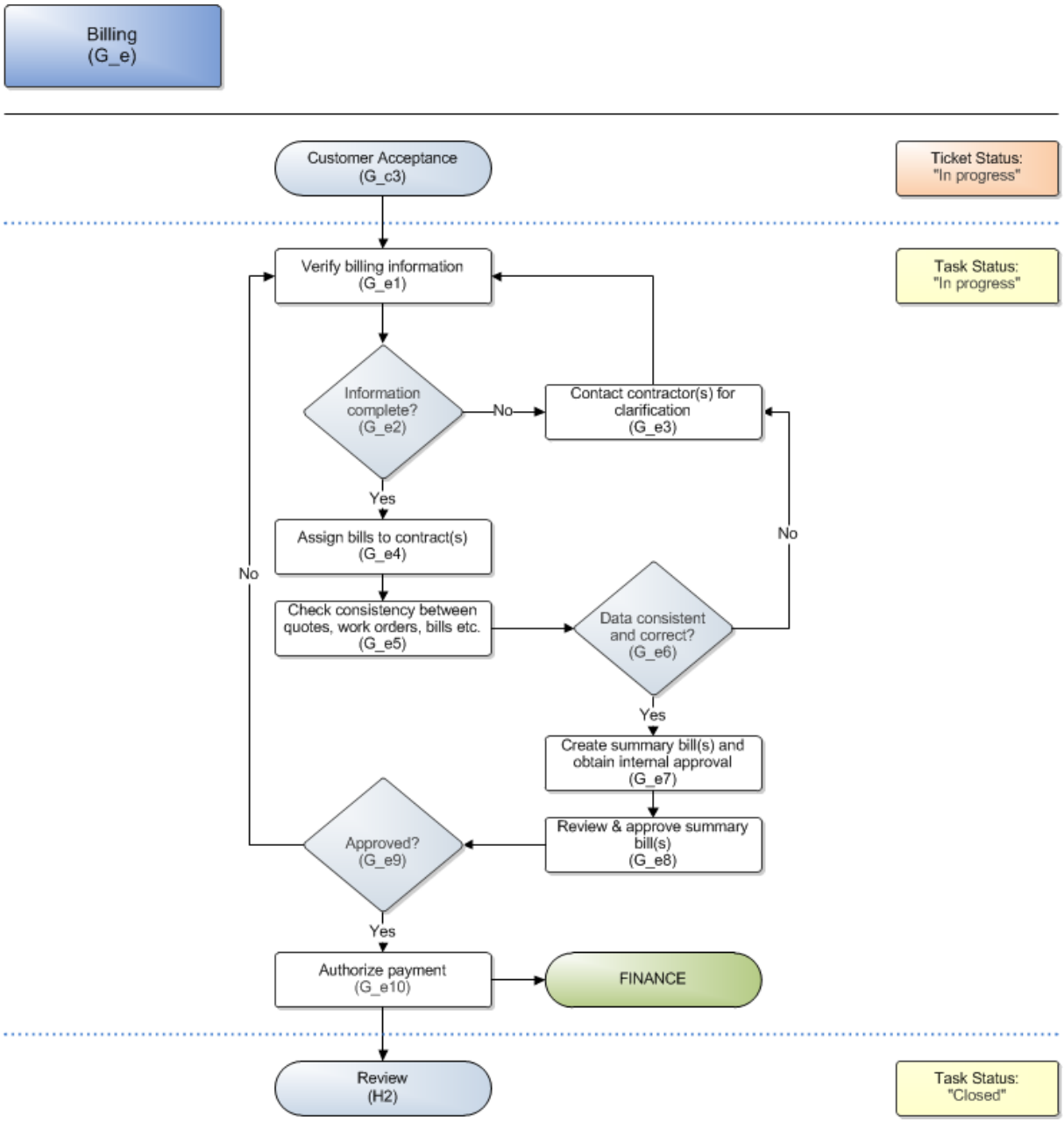


4.12.2 Activity details

ID	Description	In/Out	Tools	Roles
G_d1	Based on the specification provided as a result of the Technical and/or Customer Acceptance stage the respective work package responsible starts working on the remediation tasks necessary to obtain final acceptance of their works.	IN: G8 OUT: G_d2	•	• Builder
G_d2	Upon completion of the assigned works both the functionality of the backout/rework tasks carried out as well as the quality of the corresponding documentation, in terms of completeness and correctness, is verified to ensure it fulfils the necessary quality parameters.	IN: G_d1 OUT: G9	•	• Builder

4.13 Billing (G_e)

4.13.1 Overview

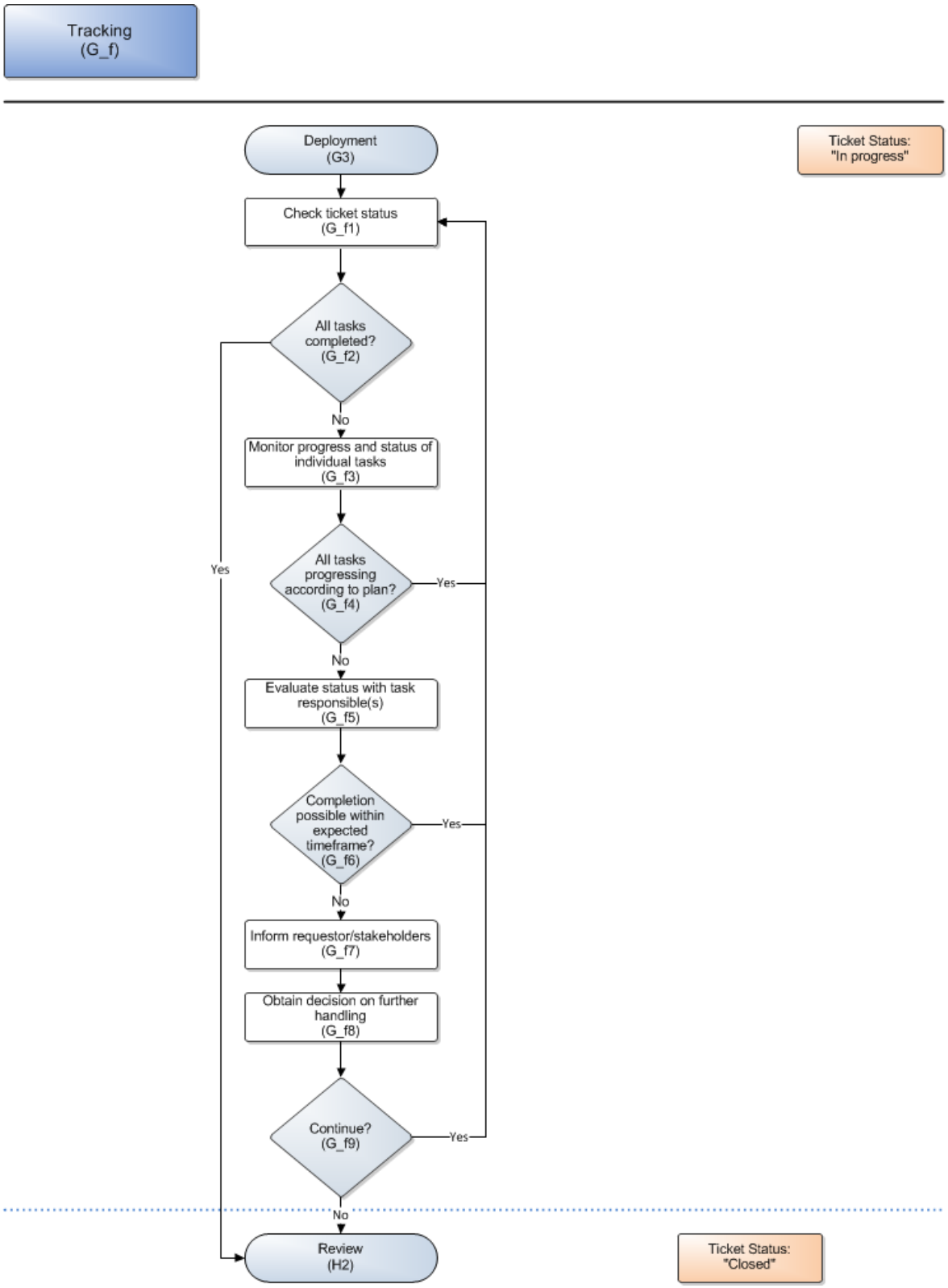


4.13.2 Activity details

ID	Description	In/Out	Tools	Roles
G_e1	As soon as a task or a complete job has been accepted by the requestor handling of payment-related tasks is started by reviewing billing information to determine general consistency and completeness.	IN: G_c3, G_e3, G_e9 OUT: G_e2	•	• Controller
G_e2	To ensure smoothest possible handling only requests with complete billing information should be processed further.	IN: G_e1 OUT: Yes = G_e4 No = G_e3	•	• Controller
G_e3	In case of missing information or inconsistencies the respective contractor is contacted to clarify the situation and obtain any missing pieces of information or documentation. If additional input from a contractor is required the corresponding ticket is set to "Waiting for 3rd Party".	IN: G_e2 OUT: G_e1	•	• Controller
G_e4	As soon as the required information is complete the billing information is structured and bills are assigned to the contractors and any other executing units involved.	IN: G_e2 OUT: G_e5	•	• Controller
G_e5	To ensure best possible quality of financial information, maintain transparency and traceability over time and avoid the amount of rework necessary billing information is reviewed to ensure consistency between works billed by contractors and work orders/quotes approved at previous stages.	IN: G_e4 OUT: G_e6	•	• Controller
G_e6	In case of missing information, inconsistencies or errors the respective contractor is contacted to clarify the situation and obtain any missing pieces of information or documentation.	IN: G_e5 OUT: Yes = G_e7 No = G_e3	•	• Controller
G_e7	If all required information is complete, consistent and correct it is compiled in a summary bill to be assigned to the Change Coordinator for review and approval.	IN: G_e6 OUT: G_e8	•	• Controller
G_e8	The works/request administrator responsible for coordinating the entire process reviews the summary bill to determine compliance with guidelines and policies and adherence to contracts they are responsible for.	IN: G_e7 OUT: G_e9	•	• Controller
G_e9	Bills which based on the Change Coordinator's assessment cannot be accepted are re-entered into the Billing cycle with appropriate comments on why the approval was not possible.	IN: G_e8 OUT: Yes = G_e10 No = G_e1	•	• Controller
G_e10	As soon as approval has been given payment for works carried out by external contractors as well as cross-charging for CERN-internal works is authorized. Authorization of payment also serves as the final trigger for closing individual tasks or the full ticket accompanying a works request.	IN: G_e9 OUT: H2 (Review), Finance	•	• Controller

4.14 Tracking (G_f)

4.14.1 Overview



4.14.1 Activity details

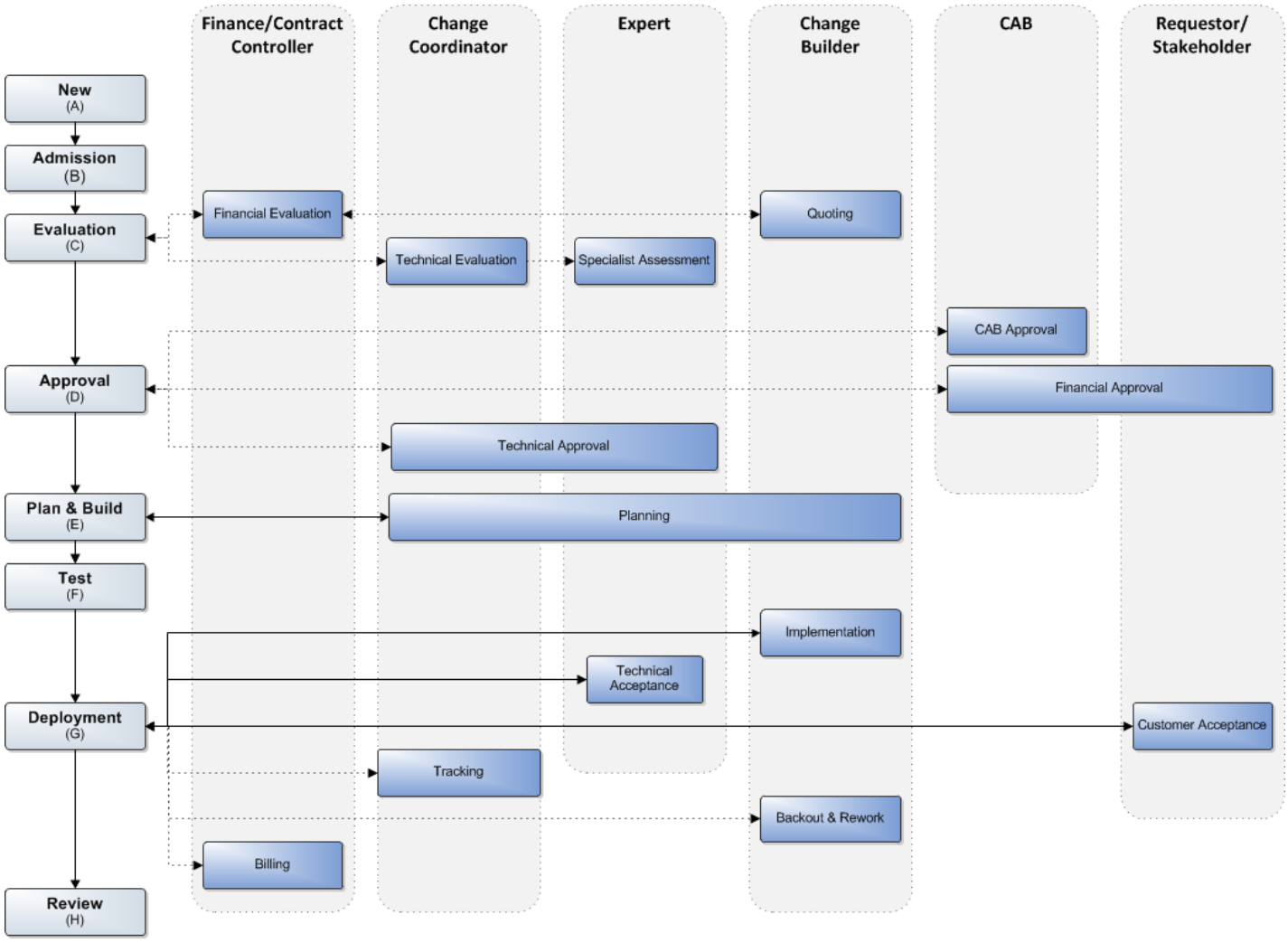
ID	Description	In/Out	Tools	RolesI
G_f1	The Tracking task is not a standard All tickets are regularly checked in accordance with defined timing criteria to keep track of their overall status as well as of the status of individual sub-tasks.	IN: G3 OUT: G_f2	•	• Coordinator
G_f2	The first validation stage is aimed at filtering out all tickets in "Resolved" status with a corresponding status of "Works/Task completed". These tickets are handled by the "Review & Acceptance" process stage. All other fully resolved tickets, especially those with status codes designating a premature, abortive closure are used as a basis for reporting and quality improvement activities.	IN: G_f1 OUT: Yes = H2 (Review) No = G_f3	•	• Coordinator
G_f3	All open tickets are analyzed to determine the progress and overall status of individual tasks.	IN: G_f2 OUT: G_f4	•	• Coordinator
G_f4	Depending on the evaluation of task progress and status a decision on further actions and consequences needs to be made. Tasks deviating from the plan need to be evaluated and may need to be escalated. Progress and status information on tasks which are on track may be used for reporting and communication purposes towards the requestor.	IN: G_f3 OUT: Yes = G_f1 No = G_f5	•	• Coordinator
G_f5	All tasks which do not progress according to plan or whose status is unclear are discussed and evaluated with the corresponding work package responsible. This may include tasks or work packages rejected during Review & Acceptance stage as well as tasks flagged as deviating from schedule by the work package responsible.	IN: G_f4 OUT: Yes = G_f1 No = G_f4	•	• Coordinator
G_f6	Based on the evaluation with the responsible executor(s) a decision needs to be made on whether completion is still possible within the designated timeframe. All requests which, given the available information, can still be completed within the designated timeframe are assigned for re-planning and re-prioritization of tasks.	IN: G_f5 OUT: Yes = G_f1 No = G_f7	•	• Coordinator
G_f7	Requests whose completion within the expected timeframe seems unlikely or impossible need to be escalated, that means the requestor and all stakeholders necessary to determine further actions need to be informed.	IN: G_f6 OUT: G_f8	•	• Coordinator
G_f8	Stakeholders evaluate the information available to come to an agreement on how to handle the case..	IN: G_f7 OUT: G_f9	•	• Coordinator
G_f9	Depending on the evaluation carried out a decision needs to be made on how to handle the case at hand. If the stakeholders decide to continue with the works the task/ticket is resubmitted for planning. The second option at this stage is to abort all works by closing the request based on a hierarchical decision. This, obviously is the more complex and demanding decision as it may result in a number of side-effects also to be considered.	IN: G_f8 OUT: Yes = G_f1 No = H2 (Review)	•	• Coordinator

5 Roles

General role model descriptions can be found in the global process documentation for CERN.

The suggested generic role model for Change Management for GS, SE & IS is displayed and described below (Roles shown on the overview but not described in details can be found in the global process documentation for CERN):

5.1 General Role Model



5.2 Finance & Contract Controller

5.2.1 Duties & Responsibilities

The Finance & Contract Controller is responsible for handling all budget- and finance-related activities that form scope of the Change Management process. In that respect this role supports in particular the Change Coordinator as well as the approval authorities

5.2.2 Tasks

The following tasks are assigned to the role of Finance & Contract Controller:

- Overseeing budgeting and quoting activities
- Quality control for and general handling of billing activities

5.2.3 Skills, Experience & Knowledge

For a successful fulfilment of this role the following skill set is recommended:

- Excellent knowledge of budgeting, quoting and billing requirements
- Good knowledge of contractual arrangements between CERN and 3rd Party contractors.

5.2.4 Assignment

Depending on the amount of work, several Finance & Contract Controllers may be required. To ensure consistency in methodology as well as in the quality of delivery they need to be supported by a common data and tool infrastructure.

5.3 Expert

5.3.1 Duties & Responsibilities

The Role of Expert is responsible for providing specialist support for areas which exceed the "normal" operational scope of Change Coordinator and Builder. Typical areas with designated Experts include:

- Fire & Safety
- Patrimony
- Locks & Keys

5.3.2 Tasks

The following tasks are assigned to the role of Expert:

- Assessment and Evaluation of requested Changes according to their expert subject matter

5.3.3 Skills, Experience & Knowledge

For a successful fulfilment of this role the following skill set is recommended:

- Excellent knowledge of and competence in their field of expertise

5.3.4 Assignment

The role of Expert should be assigned in accordance with the specific Change requirements.