Research and Development Quality Document

**1.0 Gate Overview**

The purpose of this document is to help elaborate Research and Development activities relative to the ABB Gate Model process defined in “ABB Gate Model for Technology, Product and System Development 2.0”; 9ADB000391-006, Dated 2007-04-30. Figure 1 provides an additional level of detail required to adequately develop a “Product Development” type project using the Gate Model. The following subsections define the roles, responsibilities and artifacts required by Research and Development to execute a project complying with the ABB Gate Model.



**1.1 Gate Team Roles**

* Product Manager – Individual assigned to be responsible for Product Concept. This person will work closely with the Marketing, Sales and customers to clearly define the product goals, product requirements, market strategy and return on investment.
* Program Manager – Individual assigned to be responsible for product development logistics and coordination. Program Manager is responsible for coordination of the cross functional team, definition/tracking of project schedule and budget, and for reporting of project status/issues to the management team.
* R&D Technical Lead – Individual assigned to be responsible for all system level project activities and works with other engineering disciplines to ensure product requirements are met and engineering integration activities are completed.
* R&D Hardware Lead – Individual assigned to be responsible for all hardware development and activities.
* R&D Software Lead – Individual assigned to be responsible for all software development and activities.
* R&D Mechanical Lead – – Individual assigned to be responsible for all mechanical development and activities.
* Cross Functional Team – The cross functional team consist of members from all disciplines required to develop the product from concept through to production release. Members of the team include, but are not limited to the following areas: Product Management, Sales, Marketing, Research & Development, Supply Chain, Quality, Manufacturing, Projects, Customer Support, Customer Documentation and Order Entry.

**1.2 Gate 0 – Product Concept**

TBD

**1.3 Gate 1 – Product Definition and Feasibility**

The Product Manager is the owner of Gate 1 and shall be responsible for all activities required to support Gate 1 review and approval. The artifacts owned by the Product Manager include but are not limited to the following:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Marketing Requirements Specification | TBD | Develop,  Review,  Approvals |
| Product Classification Report (import/export regulations) | <http://inside.abb.com/cawp/gad02502/bdd6f142e9d66bc6c12570c100349cb3.aspx>  <http://inside.abb.com/cawp/gad02502/3c8d26aa3416cc89c125707d0047bc34.aspx> |  |
|  |  |  |

The Program Manager will assist the Product Manager relative to the logistics of successfully executing the program: The Program Managers will perform the following tasks in support of the project:

* Coordinate, identify and document required cross functional team members needed to support the Product Manager during this phase.
* Setup, coordinate and document periodic cross functional team meetings.
* Assist the Product Manager in preparing, scheduling and holding the Gate 1 Review.
* …

The artifacts owned by the Program Manager include but are not limited to the following:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Project Kick-Off Presentation Slides | TBD | Develop,  Review,  Approvals |
| Preliminary Project Development Plan (G1 – G2) | TBD | Develop,  Review,  Approvals |
| Gate Model Report (9ADB000931-003) | TBD | Develop,  Review,  Approvals |
| Gate Model Presentation Slides | TBD | Develop,  Review, Approvals |
|  |  |  |

**1.4 Gate 2 – Product Requirements & Planning**

The Program Manager is the owner of Gate 2 and shall be responsible for driving all activities required to support Gate 2 review and approval. These activities include, but are not limited to, the following:

* Define project team structure and members.
* Define project budget and schedule. Report updates monthly to management team.
* Setup, coordinate and document periodic cross functional team meetings.
* …

The artifacts owned by the Program Manager include but are not limited to the following:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Project Development Plan (G3 – G5) | TBD | Develop,  Review,  Approvals |
| Gate Model Report (9ADB000931-003) | TBD | Develop,  Review,  Approvals |
| Gate Model Presentation Slides | TBD | Develop,  Review, Approvals |
| BU Monthly Report Slides | TBD | Develop,  Review, Approvals |

The R&D Technical Lead assigned to the program will be responsible for all technical aspects of the project. The Technical lead shall work with all other assigned R&D team members and the cross functional team to develop the following artifacts:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Technical Requirements Specification | TBD | Develop,  Review,  Approvals |
| IP Search Report | TBD | Develop,  Review,  Approvals |
| IP Clearance Report | TBD | Develop,  Review, Approvals |
|  |  |  |

**1.5 Gate 3 – Product Design**

The Program Manager is the owner of Gate 3 and shall be responsible for driving all activities required to support Gate 3 review and approval. These activities include, but are not limited to, the following:

* Maintaining project team structure and members.
* Updating project budget and schedule as required. Continuously working to maintain project budget to be at/below and project schedule to be on-time/earlier than Gate 2 commitments. Report updates monthly to management team.
* Coordinate and document periodic cross functional team meetings.
* Work with the cross functional team to ensure all planned and unplanned activities/tasks are being addressed to resolution.

The artifacts owned by the Program Manager include, but are not limited to, the following:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Gate Model Report (9ADB000931-003) | TBD | Develop,  Review,  Approvals |
| Gate Model Presentation Slides | TBD | Develop,  Review, Approvals |
| BU Monthly Report Slides | TBD | Develop,  Review, Approvals |
|  |  |  |

The R&D Technical Lead assigned to the program continues to be responsible for all technical aspects of the project. The Technical lead shall work with all other assigned R&D team members and the cross functional team to develop the following artifacts:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| IP Strategy Report | TBD | Develop,  Review,  Approvals |
|  |  |  |

The roles for the R&D team are assigned based on discipline for Gate 3. Therefore, the following disciplines are responsible for defining the product’s design: Hardware, Software and Mechanical.

The Hardware Lead shall be responsible for all hardware aspects of the project. The Hardware Lead shall work with all other assigned R&D team members and the cross functional team to develop the following artifacts:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Hardware Design Specification | TBD | Develop,  Review,  Approvals |
|  |  |  |

The Software Lead shall be responsible for all software aspects of the project. The Software Lead shall work with all other assigned R&D team members and the cross functional team to develop the following artifacts:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Software Design Specification | TBD | Develop,  Review,  Approvals |
|  |  |  |

The Mechanical Lead shall be responsible for all mechanical aspects of the project. The Mechanical Lead shall work with all other assigned R&D team members and the cross functional team to develop the following artifacts:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Mechanical Design Specification | TBD | Develop,  Review,  Approvals |
|  |  |  |

**1.6 Gate 4 – Product Implementation and Testing**

The Program Manager is the owner of Gate 4 and shall be responsible for driving all activities required to support Gate 4 review and approval. These activities include, but are not limited to, the following:

* Maintaining project team structure and members.
* Updating project budget and schedule as required. Continuously working to maintain project budget to be at/below and project schedule to be on-time/earlier than Gate 2 commitments. Report updates monthly to management team.
* Coordinate and document periodic cross functional team meetings.
* Work with the cross functional team to ensure all planned and unplanned activities/tasks are being addressed to resolution.

The artifacts owned by the Program Manager include, but are not limited to, the following:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Gate Model Report (9ADB000931-003) | TBD | Develop,  Review,  Approvals |
| Gate Model Presentation Slides | TBD | Develop,  Review, Approvals |
| BU Monthly Report Slides | TBD | Develop,  Review, Approvals |
|  |  |  |

The roles for the R&D team are assigned based on discipline for Gate 4. Therefore, the following disciplines are responsible for defining the product’s design: Hardware, Software, Mechanical, Compliance/Reliability, Production Test and Design Verification/Sustaining.

The Hardware Lead shall continue to be responsible for all hardware aspects of the project. The artifacts owned by the hardware lead and team are as follows:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Schematics & BOM | TBD | Develop,  Review,  Approvals |
| Board Layout | TBD | Develop,  Review,  Approvals |
| Hardware Test Specification and Report | TBD | Develop,  Review,  Approvals |

The Hardware lead and the hardware team are responsible for the development, review and approval of the above artifacts. The hardware team’s focus during this phase shall be to implement, fabricate, test and baseline the products hardware implementation to the level that it meets the product requirements documented in the Technical Requirement Specification (Gate 2) and the design documented in the Hardware Design Specification (Gate 3).

The Software Lead shall be responsible for all software aspects of the project. The Software Lead shall work with all other assigned R&D team members and the cross functional team to develop the following artifacts:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Software Design Specification | TBD | Develop,  Review,  Approvals |
|  |  |  |

The Mechanical Lead shall be responsible for all mechanical aspects of the project. The Mechanical Lead shall work with all other assigned R&D team members and the cross functional team to develop the following artifacts:

|  |  |  |
| --- | --- | --- |
| **Document Name** | **Document Template Location** | **Owner Responsibilities** |
| Mechanical Design Specification | TBD | Develop,  Review,  Approvals |
|  |  |  |

**1.7 Gate 5 – Product Release to Production**

**2.0 Gate Development Processes**

**2.1 Document Configuration Management**

* **Watermarks identifying that they are “CONTROLLED” shall be included in all documents listed in Section 1.**
* **All Documents listed in Section 1 are controlled documents and shall be placed in the controlled area in the respective Gate. The Program Manager shall be the only individual allowed to update controlled documents. All other project members shall have read-only access to documents in the controlled area.**

**2.2 Document Naming Convention**

|  |  |  |  |
| --- | --- | --- | --- |
| **Gate 1** | | | |
| **Document Description** | **Document Name** | | **Location** |
| Marketing Requirements Document | Marketing Requirements Document - ***project name*** | |  |
| Gate 1 BU MRD Presentation Slides | Gate 1 Power Point Presentation - *project name* | |  |
| Gate 1 BU Model Report | Gate 1 Model Report - *project name* | |  |
| Gate 1 BU Approval | Gate 1 BU Approval - *project name* | |  |
| **Gate 2** | | | |
| **Document Description** | **Document Name** | |  |
| Technical Requirements Documents | Technical Requirements Document - *project name* | |  |
| Technical Requirements Documents Review | Technical Requirements Document - *project name* – Review Minutes | |  |
| Technical Requirements Documents Approval | Technical Requirements Document - *project name* – Approval | |  |
| Project Development Plan | Project Development Plan - *project name* | |  |
| Project Development Plan Review Minutes | Project Development Plan - *project name-* Review Minutes | |  |
| Project Development Plan Approval | PDP- *project name-* Approval | |  |
| Gate 2 BU Presentation Slides | Gate 2 PowerPoint Presentation - *project name* | |  |
| Gate 2 BU Model Report | Gate 2 Model Report - *project name* | |  |
| Gate 2 BU Approval | Gate 2 BU Approval - *project name* | |  |
| Detailed Project Schedule | Detailed Project Schedule - *project name* | |  |
| Cross Functional Meeting Minutes | Cross Functional Meeting Minutes - *project name* | |  |
| Gate 3 | | | |
| **Document Description** | | **Document Name** |  |
| Hardware Design Specification | | Hardware Design Specification -project name |  |
| Hardware Design Specification Review Minutes | | Hardware Design Specification - *project name-* Review Minutes |  |
| Hardware Design Specification Approval | | Hardware Design Specification -  *project name-* Approval |  |
| Software Design Specification | | Software Design Specification - project name |  |
| Mechanical Design Specification | | Mechanical Design Specification - project name |  |
| System Verification and Test Plan | | System Verification Test Plan - project name |  |
| Gate 3 BU MRD Presentation Slides | | Gate 3 PowerPoint Presentation - *project name* |  |
| Gate 3 BU Model Report | | Gate 3 Model Report - *project name* |  |
| Gate 3 BU Approval | | Gate 3 BU Approval - *project name* |  |
|  | |  |  |
| Gate 4 | | | |
| **Document Description** | | **Document Name** |  |
| System Verification Test Report | | System Verification Test Report - project name |  |
| User Manual and Documentation | | User Manual and Documentation - project name |  |
| Gate 4 BU Presentation Slides | | Gate 4 PowerPoint Presentation - *project name* |  |
| Gate 4 BU Model Report | | Gate 4 Model Report - *project name* |  |
| Gate 4 BU approval | | Gate 4 BU Approval - *project name* |  |
|  | |  |  |
| Gate 5 | | | |
| **Document Description** | | **Document Name** |  |
| Gate 5 BU Presentation Slides | | Gate 5 PowerPoint Presentation - *project name* |  |
| Gate 5 BU Model Report | | Gate 5 Model Report - *project name* |  |
| Gate 5 BU approval | | Gate 5 BU Approval - *project name* |  |
| All Gates | | | |
| **Document Description** | | **Document Name** |  |
| Emails relative to any gate | | Email *- subject* |  |
| General Meeting Minutes | | General Meeting Minutes *- subject* |  |
| Memo for the Record | | Memo Record *- subject* |  |

**2.3 Artifact Reviews and Approvals**

* **Use standard review/action items form already developed documenting minutes, action items and attendees. Artifact owner is responsible for having all action items reviewed, addressed and moved to the closed status prior to obtaining document approval.**
* **Showing redlines from previous approval to next review is required. Suggested approach is to baseline approved document and enable redlines before modifying.**

**3.0 Things to Do**

* Need to add compliance and certification documents to gate 5.
* Need to add Production Work Instructions to gate 4 ???
* Need to add who is required to approve documents (in-house and at BU level) for all controlled documents.
* Request to add e-learning module requirement to gate 5. See Juergen email dated 04/18/2012.