Annex G – CONCEPTUAL MODELING PROCESS ACTIVITY DESCRIPTION

Table G-1: Generic Template for Specification of Process Activity.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Step Name and Aliases	*<Denotative name of process step appears here.>*
Process Activity Description	
• Process Step Rationale / Need / Motivation	*<Here an account of the motivation of the subject Process Step is provided, in order that the investment agent executing the Process Step can have explicit record of his expected intention in executing the subject Process Step.>*
Process Activity Initiation	
• Entrance Criteria	*<This field specifies component values of the state of the decision problem in its entirety that are necessary and sufficient for the subject Process Step to be begun with high probability of successful completion.>*
Process Activity Method	
• Process Activity Procedure	*<In this field, the investment evaluation agent is provided procedural guidance for the execution of the subject Process Step. Note that relationships to other activities, needs for tools or information, and expected work-products are specified in other form records. Process Step procedure should be as nearly as possible algorithmically prescriptive. Note however that any procedure may entail almost arbitrary complexity and that the procedure step in question may be replaced with defining notation other than text.>*
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	*<Instruction cites relationships among activities. These may be composition (is a part of) relationship in which one Process Step is executed as one of several components of a composite Process Step. Otherwise, Process Step precedence (comes-before-relationship) and Process Step successor (comes-after-relationship) may be designated. This latter relationship specification may be contingent allowing programmatic branching, loop recursion, or self repetition.>*
• Process Activity Information Flow	*<Typically information from: a) inside the process (endogenous) – perhaps having been developed by means of the execution of one or another of the activities; or b) information from outside the decision process (exogenous) may be identified as necessary input to a Process Step.>*

• Process Activity Information Flow (cont'd)	*<Alternatively information may flow out of the Process Step having been generated by execution of the Process Step. In either case it is prudent to indicate the information pool involved as container, and the information type specification needed or generated.>*
Associated Entities	
• Tools	*<Identify tools such as hardware or software necessary and sufficient to complete the Process Step. In the case of M&S investment Process Step, algorithms are likely tool-types.>*
• Actor-Agents	*<Indicate the actor agent (individual member of one or another stakeholder class) responsible for completion of the Process Step. Clearly Groups or anonymous agents may be designated. If the responsibility of members of the Group need to be differentiated, it may be prudent to decompose the Process Step into its component parts in order to reduce the cardinality of agents to activities from N-to-1 to 1-to-1.>*
• Information Pools	*<Data stores of any type containing information used as input or generated as output from a particular Process Step. May contain intermediate information re-used by successor activities, or components of the process result compiled as residual product documentation.>*
• Product / Object / Artefacts	*<The principle intended output in any form consequent execution of the subject Process Step. Ultimately an investment decision, but meanwhile, information artefacts, qualifications to be associated with the decision, or guidance as to how the resulting decision should be pursued.>*
Process Activity Completion	
• Exit Criteria	*<This field specifies component values of the state of the decision problem in its entirety that are necessary and sufficient for the subject Process Step to be considered finished with high probability of successful completion.>*

Table G-2: Conceptual Model Process Activity 1.1 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA1.1 – Identify and Map Stakeholder Responsibilities.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is necessary to produce PA1.1 – Stakeholder Descriptions which are used to derive conceptual model requirements and conceptual model Knowledge Needs.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activities, availability of information and establishment of operational capability: • May begin once PA1.2 – Define Purpose and Intended Use of M&S Effort initiates.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITIES establish the context within which the bulk of direct conceptual model population will occur: • Identify relevant M&S responsibilities based upon purpose and intended use, constraints, and policies. • Map responsibilities into stakeholder roles by category. • Identify stakeholders by organization or name based upon M&S purpose and intended use, constraints, and policies. • Map roles onto individual stakeholders. • Document results in P1.1 – Stakeholder Description.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Once initiated, may be executed concurrently with other Phase 1 activities, or recursively in an iterative process with activities in other phases.
• Process Activity Information Flow	Information from external pools such as listed below flow into this process step. Information from the other three activities in the first phase flow into this activity. All information flow out of this activity is to the P1.1 – Stakeholder Description.
Associated Entities	
• Tools	No custom tools.
• Actor-Agents	Producer.
• Information Pools	• Points of contact lists. • Employee roles. • Organizational charts.

• Information Pools (cont'd)	• Personnel databases. • Referrals. • Resumes. • Biographies, etc.
• Product / Object / Artefacts	This Process Activity produces the P1.1 – Stakeholder Description.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity include the following: • All stakeholders are identified and mapped to roles and responsibilities.

Table G-3: Conceptual Model Process Activity 1.2 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA1.2 – Define Purpose and Intended Use of M&S Effort.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is necessary to produce P1.2 – Need Statement which is used to derive conceptual model requirements and conceptual model Knowledge Needs.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activities, availability of information and establishment of operational capability: • May begin upon stated or implied intent to develop a model, simulation, or conceptual model.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITIES establish the context within which the bulk of direct conceptual model population will occur: • Collect information from Information Pools below, relating to purpose and intended use of M&S effort. • Integrate and deconflict collected information into a self-consistent set of descriptions of M&S purpose and use. • Provide information to other activities in this phase. • Translate M&S purpose and intended use into descriptions of needs for the conceptual model. • Document descriptions of needs for the conceptual model in P1.2 – Need Statement.

Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Once initiated, may be executed concurrently with other Phase 1 activities, or recursively in an iterative process with activities in other phases.
• Process Activity Information Flow	Information from external pools such as listed below flow into this process step. No information from the other three activities in this phase flows into this activity. Information from this activity may flow into the other three activities in the first phase. Information flows out of this activity to the P1.2 – Need Statement.
Associated Entities	
• Tools	No custom tools.
• Actor-Agents	Producer.
• Information Pools	Information pools relevant to this activity include: • Task orders. • Mission needs statements. • User requirement documents. • Requests for proposal. • Statements of work. • Formal or informal directives. • Test agreements, etc.
• Product / Object / Artefacts	This Process Activity produces the P1.2 – Need Statement.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity include the following: • Purpose and intended use of M&S effort is defined.

Table G-4: Conceptual Model Process Activity 1.3 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA1.3 – Identify Constraints on the M&S Effort.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is necessary to produce P1.3 – Constraints and Policies which is used to derive conceptual model requirements and conceptual modeling knowledge needs.

Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • May begin once PA1.2 – Define Purpose and Intended Use of M&S Effort initiates.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITIES establish the context within which the bulk of direct conceptual model population will occur: • Collect information from Information Pools below, relating to constraints on the M&S effort. • Integrate and deconflict collected information into a self-consistent set of descriptions of M&S constraints. • Provide information to the PA1.1 activity for constraints that impact selection of stakeholders and respective responsibilities. • Document Constraints for the conceptual model in P1.3 – Constraints and Policies.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Once initiated, may be executed concurrently with other Phase 1 activities, or recursively in an iterative process with activities in other phases.
• Process Activity Information Flow	Information from external pools such as listed below flow into this process step. Information from PA1.2 may flow into this activity. Information from this activity may flow into PA1.1. Information flows out of this activity to P1.3 – Constraints and Policies.
Associated Entities	
• Tools	No custom tools.
• Actor-Agents	Producer.
• Information Pools	Information pools relevant to this activity include: • Documented resource constraints. • Senior stakeholder preferences and requirements. • Planning/budgeting/management limitations. • Legacy M&S preferences and availability. • Data availability. • Enterprise preferences, etc.
• Product / Object / Artefacts	This Process Activity contributes to P1.3 – Constraints and Policies.

Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • Constraints of M&S effort are defined sufficiently to constrain the scope and content of the conceptual model. • Sufficient contributions are made for the development of P1.3 – Constraints and Policies.

Table G-5: Conceptual Model Process Activity 1.4 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA1.4 – Identify Mandatory Enterprise Policies.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is necessary to produce P1.3 – Constraints and Policies which is used to derive conceptual model requirements and conceptual model Knowledge Needs.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • May begin once PA1.2 – Define Purpose and Intended Use of M&S Effort initiates.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITIES establish the context within which the bulk of direct conceptual model population will occur: • Collect information from Information Pools below, relating to Enterprise Policy Mandates. • Integrate and deconflict collected information into a self-consistent set of mandates. • Provide information to the PA1.1 activity for mandates that impact selection of stakeholders and respective responsibilities. • Document Mandates for the conceptual model in P1.3 – Constraints and Policies.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Once initiated, may be executed concurrently with other Phase 1 activities, or recursively in an iterative process with activities in other phases.

• Process Activity Information Flow	Information from external pools such as listed below flow into this process step. Information from PA1.2 may flow into this activity. Information from this activity may flow into PA1.1. Information flows out of this activity to P1.3 – Constraints and Policies.
Associated Entities	
• Tools	No custom tools.
• Actor-Agents	Producer.
• Information Pools	Information pools relevant to this activity include: • Enterprise standard operating procedures. • Industry and government standards. • Enterprise executive mandates law. • Agency regulations. • Agency directives. • Written policy. • Implied enterprise mandates, etc.
• Product / Object / Artefacts	This Process Activity contributes to P1.3 – Constraints and Policies.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • Enterprise Mandates are defined sufficiently to align the scope and content of the conceptual model to mandates. • Sufficient contributions are made for the development of P1.3 – Constraints and Policies.

Table G-6: Conceptual Model Process Activity 2.1 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA2.1 – Identify, Analyze and Record conceptual Model Mission and Simulation Space Requirements.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity produces the requirements that will guide the design of the conceptual model and indirectly also the conceptual model itself.
• Process Activity Classification	May be classified depending on sensitivity of the content.

Process Activity Initiation	
• Entrance Criteria	May begin as soon as some of the needs for the simulation are clarified or some constraints or policies applicable to the development project are defined.
Process Activity Method	
• Process Activity Procedure	This Process Activity will typically consist of the following sub-activities: • Discussions with the initiator/client in order to ensure a mutual understanding of the client's needs. • Conferring with domain and M&S experts in order to refine the needs statement into more detailed requirements. This activity may profitably be based on descriptions of scenarios and/or use cases. • Consulting documents describing the mission domain. • Review of earlier requirement documents and legacy models in order to leverage earlier development efforts. • Documenting the elicited requirements using simple and unambiguous language.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This Process Activity initiates the definition phase of the conceptual model development process. It may be carried out in several passes after PA2.2 – Requirement Verification has revealed incompleteness, incorrectness or ambiguities.
• Process Activity Information Flow	The activity takes as inputs P1.2 – Need Statement and P1.3 – Constraints and Policies and produces a preliminary requirement specification.
Associated Entities	
• Tools	Requirements management tool.
• Actor-Agents	Conceptual model producer, domain SMEs, M&S SMEs.
• Information Pools	Legacy requirements and conceptual models, descriptions of military equipment and documentation of military tactics, techniques, and procedures.
• Product / Object / Artefacts	This Process Activity produces a preliminary requirement specification to be verified in PA2.2.
Process Activity Completion	
• Exit Criteria	All relevant requirements for the conceptual model have been identified and documented.

Table G-7: Conceptual Model Process Activity 2.2 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA2.2 – Verify Requirements with Respect to Needs, Constraints and Policies.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity will ensure that all needs are accounted for and constraints and policies are adequately described in the requirement specification.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • At least some requirements must have been documented prior to starting this activity.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITIES establish the context within which the bulk of direct conceptual model population will occur: • Specify the quality attributes that the requirement specification shall satisfy. • Review and modify the conceptual model requirement specification to ensure that the chosen quality attributes are satisfied.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This activity follows the PA2.1 – Requirements Definition and is followed PA2.3 – Synergize Requirements.
• Process Activity Information Flow	The activity takes as inputs P1.2 – Need Statement and P1.3 – Constraints and Policies and updates the preliminary requirement specification. In addition, V&V evidence must be added to Meta data of the conceptual model.
Associated Entities	
• Tools	Requirement management tool.
• Actor-Agents	Producer (requirement engineer).
• Information Pools	Information pools relevant to this activity include: • Preliminary requirement specification. • Meta data.
• Product / Object / Artefacts	This Process Activity updates the preliminary requirement specification.

Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • All requirements have been evaluated with respect to chosen quality attributes. • Any identified discrepancies have been rectified.

Table G-8: Conceptual Model Process Activity 2.3 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA2.3 – Synergize Conceptual Model, Mission and Simulation Space Requirements.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	Reconciling any incompatibilities between conceptual model, mission and simulation space requirements.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • At least some requirements of different categories must have been defined.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • Review and modify the conceptual model requirement specification to ensure compatibility between conceptual model, mission, and simulation space requirements.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This activity follows PA2.2 and is followed by PA2.4.
• Process Activity Information Flow	This Process Activity takes the preliminary requirement specification produced by PA2.2 as input and produces P2.1 – Conceptual Model Requirement Specification.
Associated Entities	
• Tools	Requirement management tool.
• Actor-Agents	Producer (requirement engineer).

• Information Pools	Information pools relevant to this activity include: • Preliminary requirement specification.
• Product / Object / Artefacts	P2.1 – Conceptual Model Requirement Specification.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • All requirements have been evaluated for compatibility with respect to requirements of the other categories. • P2.1 has been completed.

Table G-9: Conceptual Model Process Activity 2.4 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA2.4 – Derive Mission and Simulation Space Knowledge Needs.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	The purpose of this Process Activity is to communicate to the conceptual model producer what knowledge must be acquired in order to design and build a conceptual model that will serve its intended purpose.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • At least some conceptual model requirement must have been identified and documented.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • Analyze the requirement specification in order to derive knowledge needs. • Document knowledge needs.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This Process Activity follows the PA2.3 and is the final activity in Process Phase 2.
• Process Activity Information Flow	This Process Activity uses P2.1 – Conceptual Model Requirement Specification as input and produces P2.2 – Conceptual Model Knowledge Acquisition Needs as output.

Associated Entities	
• Tools	None.
• Actor-Agents	Producer (knowledge engineer).
• Information Pools	Information pools relevant to this activity include: • Legacy knowledge. • Need descriptions.
• Product / Object / Artefacts	This Process Activity produces P2.2 – Conceptual Model Knowledge Acquisition Needs.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • An exhaustive list of knowledge elements needed to design and build the desired conceptual model has been documented in P2.2.

Table G-10: Conceptual Model Process Activity 3.1 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA3.1 – Identify Authoritative Knowledge Sources.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is about identifying authoritative knowledge sources to fetch correct and authoritative information that describes a certain domain, for example through books, papers, tutorials, interviewing the SMEs, etc.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • May begin once P2.1 – Conceptual Model Requirement Specification and P2.2 – Conceptual Model Knowledge Acquisition Needs exist.
Process Activity Method	
• Process Activity Procedure	There is no specific methodology for identifying appropriate sources for KA, but here is a couple of recommendations: • Having a deeper understanding of the problem domain and (preferably) having experience of the particular area are necessary qualities for success.

• Process Activity Procedure (cont'd)	• Rely only on authoritative knowledge sources, those authorised by some organisation/authority beforehand (who this person or agency should be is beyond the scope of this report). • These sources can be anything from books, web information, papers, regulations documents, pictures, maps, and case studies, but perhaps most important of all interviews with Subject-Matter Experts (SMEs).
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This activity may be initiated as soon as the inputs P2.1 – Requirement Specification and P2.2 – Conceptual Model Knowledge Acquisition Needs are available. But it must be done before activity PA3.4 – Gather, Structure and Document Knowledge begins.
• Process Activity Information Flow	This activity takes as inputs P2.1 – Conceptual Model Requirement Specification and P2.2 – Conceptual Model Knowledge Acquisition Needs and produces a list of authoritative knowledge sources which corresponds to requirements and needs identified in Phase 2.
Associated Entities	
• Tools	No custom tools.
• Actor-Agents	No specific actors or agents has been identified, however existence of some organisation or authority who can point out authoritative knowledge sources is of great benefit.
• Information Pools	Information pools relevant to this activity include: • List of authoritative knowledge sources for different military activities. • Simulation expertise, etc. • Points of contact lists. • List of SMEs. • Employee roles. • Organizational charts. • Biographies, etc.
• Product / Object / Artefacts	The final product of this activity will be a list of authoritative knowledge sources for a certain kind of knowledge.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • When at least one authoritative knowledge sources adequate for the certain kind of knowledge has been identified.

Table G-11: Conceptual Model Process Activity 3.2 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA3.2 – Search for the Reusable Knowledge in the Conceptual Model Repository.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	Given that a conceptual model repository already exists, no acquisition of new knowledge is justified before checking if the required conceptual model already is either partly or completely modelled and stored in the conceptual model repository.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • May begin once P2.1 – Conceptual Model Requirement Specification and P2.2 – Conceptual Model Knowledge Acquisition Needs exist.
Process Activity Method	
• Process Activity Procedure	There is no specific methodology for identifying appropriate sources for KA, but here are a couple of recommendations. The list of needs and requirements will be the foundation for building the necessary queries to the repository: • Analyze P2.1 – Conceptual Model Requirement Specification and P2.2 – Conceptual Model Knowledge Acquisition Needs to find syntactic and/or semantic key words for the search. • Do search in an already existing conceptual model repository for the reusable knowledge. Keep in mind that several qualitative properties are critically important to search and find either the reusable knowledge component (part of a conceptual model) or a complete conceptual model fulfilling a specific need: • One is to try to model knowledge in smaller components that makes reusability easier. • The other property is to have a degree of formalisation and semantic description that makes it possible to compose smaller components for building the needed conceptual model. • The third is to have good Meta data addressing artefacts in the conceptual model Repository; this makes it possible to easily find the knowledge which corresponds to the need.

Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This activity may be initiated as soon as the inputs P2.1 – Conceptual Model Requirement Specification and P2.2 – Conceptual Model Knowledge Acquisition Needs are available. But it must be done before activity PA3.4 – Gather, Structure and Document Knowledge begins.
• Process Activity Information Flow	This activity takes as inputs P2.1 – Conceptual Model Requirement Specification and P2.2 – Conceptual Model Knowledge Acquisition Needs and produces a list of authoritative knowledge sources which corresponds to requirements and needs identified in Phase 2.
Associated Entities	
• Tools	Query making and repository searching tools.
• Actor-Agents	No specific actors or agents have been identified.
• Information Pools	Information pools relevant to this activity include: • Reusable knowledge components which partly or completely fulfill the need may be found as an intermediate product.
• Product / Object / Artefacts	The final product of this activity will be either: • A positive answer that the required conceptual model is found in the conceptual model repository; • Reusable knowledge components which only partly fulfill the need has been found; or • A negative answer about nothing of value for the specific need was found.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • When the search is done and adequate result has been retrieved.

Table G-12: Conceptual Model Process Activity 3.3 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA3.3 – Identify Knowledge Gaps and Bounds.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity concerns whether the knowledge retrieved from an existing conceptual model repository is in accordance with the requirements and needs or not.

• Process Activity Rationale / Need / Motivation (cont'd)	The reusability of already gathered knowledge will be examined to see if they can be used for the new purpose. This outcome aids in identifying what is missing.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • This activity will happen (will be considered) only if the result of the previous activity PA3.2 – Search for the Reusable Knowledge is case b), which is the knowledge components found in the conceptual model repository partly fulfill the need.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • If the result of PA3.2 is case a) "the required knowledge is found in the conceptual model repository" end this activity immediately and initiate PA3.5. • If the result of PA3.2 is case c) "nothing of value for the specific need was found" end this activity immediately and initiate PA3.4. • If the result of PA3.2 is case b) "reusable knowledge components which only partly fulfil the need has been found"; then the result has to be analyzed and compared with the need to identify knowledge gaps, i.e., what part/parts are missing.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This activity will be initiated after PA3.2 is done. Depending to the result it will either be followed by PA3.4 or PA3.5.
• Process Activity Information Flow	This activity takes as inputs P2.2 – Conceptual Model Knowledge Acquisition Needs and the result of PA3.2 – Search for the Reusable Knowledge, and if no knowledge gap is identified it will initiate PA3.5, but if significant knowledge is still missing will produce an intermediate document addressing that gap which will be used of PA3.4 – Gather, Structure and Document Knowledge.
Associated Entities	
• Tools	Knowledge comparison tools.
• Actor-Agents	Knowledge engineer, SME.

• Information Pools	Information pools relevant to this activity include: • Intermediate result from PA3.2, P2.1 and P2.2.
• Product / Object / Artefacts	The final product of this activity will either be: • No knowledge gaps identified; or • A notion of what kind of information is missing and a list of authorized knowledge sources for KA.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • When knowledge comparison is done and the gaps are addressed.

Table G-13: Conceptual Model Process Activity 3.4 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA3.4 – Gather, Structure and Document Knowledge.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is about acquiring certain knowledge which often is not documented anywhere but only available through Subject-Matter Experts (SME). This acquired knowledge will then be structured and documented for further use.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • When the result of PA3.2 – Search for the Reusable Knowledge has been case c) “nothing of value for the specific need was found”; or • When PA3.3 – Identify Knowledge Gaps and Bounds has ended.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • The first step in this activity is about gathering knowledge. Information sources for military activities can be anything from instructions, books, military doctrines, military scenarios, case studies to military experts.

• Process Activity Procedure (cont'd)	However, the information that is needed for a certain purpose is often not documented anywhere and is only available through SMEs. Below we provide examples of techniques that can be used for this kind of knowledge elicitation (mainly through interviews): • Unstructured: The SME has a general discussion of the domain, designed to provide a list of topics and concepts. • Structured: The interviewer asks the SME or end user questions relating to a specific topic. • Problem-solving: The SME is provided with a real-life problem, something that they deal with during their working life and are then asked to solve it. As the expert does so, they are required to describe each step, and the reasons for doing it. • Prototyping: The SME is asked to evaluate a prototype of a system. • Simulation: The SME is asked to use a simulator so that the SME's behaviors can be observed. • Dialogue: The SME interacts with a client, in the way that they would normally do during their normal work routine. • Sample lecture preparation: The SME prepares a lecture, and the knowledge engineer analyses its content. • Questionnaires: These are useful when the knowledge is to be gathered from several different subject-matter experts. • When the knowledge is acquired a methodology must be chosen to structure the knowledge. • Finally the gathered and structured knowledge must be documented for further use and reuse. • Last but not least must conceptual model Meta data product be update with new information.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This activity will be initiated either by PA3.2 – Search for the Reusable Knowledge or after PA3.3 – Identify Knowledge Gaps and Bounds is done. This activity must be done before PA3.5 – Generate/Extend a Domain Ontology begins.
• Process Activity Information Flow	This activity takes the intermediate product generated in PA3.3 – Identify Knowledge Gaps and Bounds as input and produces another intermediate product called structured knowledge corpus.

Associated Entities	
• Tools	• Knowledge Acquisition (KA) tools. • Structuring tools.
• Actor-Agents	• Knowledge Acquisition expert. • Knowledge engineer.
• Information Pools	Intermediate result from PA3.3, P2.1 and P2.2. Information sources for military activities can be anything from instructions, books, military doctrines, military scenarios, case studies to military experts. However, the information that is needed for a certain purpose is often not documented anywhere and is only available through SMEs.
• Product / Object / Artefacts	The final product of this step is some structured and documented information gathered to fulfil a certain need of knowledge.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • When the needed knowledge is gathered, structured and documented.

Table G-14: Conceptual Model Process Activity 3.5 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA3.5 – Generate/Extend a Domain Ontology.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity covers structuring, tagging, and storing the gathered information either as new domain ontology or as an extension to an existing one.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • May be initiated by PA3.3 – Identify Knowledge Gaps and Bounds. • When PA3.4 – Gather, Structure and Document Knowledge has ended and the intermediate product Structured Knowledge corpus is available.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur:

• Process Activity Procedure (cont'd)	• New knowledge most likely will introduce new military concepts, properties, relations, and constraints which should be stored in some kind of knowledge base for future use and reuse.
	• Check if ontology/ontologies for the current subject already exist, and in that case update the/those ontology/ontologies with the most recent acquired knowledge.
	• If no ontology exists for the current subject/domain one may be created.
	• There are different methodologies for integrating these new concepts into existing ontologies as well as for creating new ones. The appropriate creation methodology will depend upon, and be influenced by, the requirements and design criteria that exist. Examples of these for such an ontological knowledge base may be:
	  • Flexibility;
	  • Adaptability;
	  • Traceability;
	  • Machine readability;
	  • Interoperability; and
	  • Reusability for multiple applications; or might simply be rapid and easy development.

Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	• The previous activities captured and documented new knowledge about a certain military activity that did not already exist in the conceptual model repository. As soon as this intermediate product (new documented knowledge) is available this activity can begin. • This activity may indicate that the acquiring and documentation of knowledge is done and ready for review, and thereby PA3.6 may be initiated.
• Process Activity Information Flow	This activity takes the intermediate product generated in PA3.4 called structured knowledge corpus and either produces a new ontology or update/extend an existing one.
Associated Entities	
• Tools	• Ontology engineering tools. • Ontology creation tools. • Ontology integration tool.
• Actor-Agents	• Ontology experts. • Conceptual modeler.

• Information Pools	Information pools relevant to this activity include: • Intermediate result from PA3.3. • Structured knowledge corpus created in PA3.4. • Existing ontology repository. • Knowledge base.
• Product / Object / Artefacts	The final product of this activity will either be: • A new domain ontology; or • An updated/extended version of an existing ontology, covering the latest acquired knowledge.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • When domain ontology is build; or • An existing one is updated/extended.

Table G-15: Conceptual Model Process Activity 3.6 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA3.6 – Review Validity of Knowledge with Respect to the Authoritative Knowledge Sources.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity discusses and examines the validity of acquired knowledge with respect to authoritative knowledge sources.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activity, availability of information and establishment of operational capability: • Will be initiated when PA3.5 – Generate/Extend a Domain Ontology is done and the acquired knowledge is ready for review.
Process Activity Method	
• Process Activity Procedure	The validity of acquired knowledge with respect to authoritative knowledge sources can be done using different V&V methodologies, e.g., GM-V&V. The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur:

• Process Activity Procedure (cont'd)	• It is about checking – preferably performed by a VV&A agent – with the experts, whose realities have been captured and documented, to see if the documented knowledge is correct and completely represents the activity. • Examine whether the result of the knowledge acquisition phase is acceptable to the owner of the mission space (the SME). • An ontology expert may also examine if the generation or integration of the ontology is done correctly.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This activity may be initiated as soon as the activity PA3.5 – Generate/Extend a Domain Ontology is done and the acquired knowledge or the ontology is ready for review. And when the acquired knowledge or the ontology is validated this phase is completed.
• Process Activity Information Flow	This activity takes P2.2 – Conceptual Model Knowledge Acquisition Needs and the intermediate product from PA3.5 the ontology, and produce the P3.1 – Validated Knowledge.
Associated Entities	
• Tools	• V&V tools. • Ontology reviewing tools.
• Actor-Agents	• V&V agents. • SMEs. • Ontology experts.
• Information Pools	Information pools relevant to this activity include: • The ontology created, updated or extended as a result of PA3.5. • Existing ontology repository or knowledge base. • P2.2 – Conceptual Model Knowledge Acquisition Needs. • List of authoritative knowledge sources produced as an intermediate product in PA3.1.
• Product / Object / Artefacts	This is the last activity and the last check within Phase 3, and artefacts which pass this check are qualified to go to the next phase of the conceptual modeling process.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • When the acquired knowledge is validated.

Table G-16: Conceptual Model Process Activity 4.1 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA4.1 – Search for Existing Conceptual Models that May be Partially of Fully Re-Used to Support the Current Conceptual Model Development.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity identifies the need to partially or fully reuse existing conceptual models.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activities, availability of information and establishment of operational capability: • May begin when PA2.3 has substantial progress and when PA2.1 – Conceptual Model Requirement Specification has substantial input to start identifying search criteria for reuse. • A repository with conceptual models that have Meta data descriptions that is relevant to designing conceptual models.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • Parse P2.1 – Conceptual Model Requirement Specification to become acquainted with what design characteristics are required. • Identify search criteria based upon these required design characteristics and search for candidate conceptual model. • If conceptual model compositions have already been identified in the preliminary conceptual model design, search for conceptual models with similar design characteristics. • Identify suitability for reuse based on criteria listed in the conceptual model Requirements Specification. • Record or update the found conceptual models to the preliminary conceptual model design artefact.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This activity is executed at least once and may be executed iteratively after new inputs to the preliminary conceptual model design during PA4.2, PA4.3, PA4.4 or PA4.5 or after the failure to meet the conceptual model requirements during PA4.6

• Process Activity Sequence and Control-Flow (cont'd)	evaluation or after the addition of requirements in P2.1 from either some build experience in PA5.1, the arrival of new stakeholders, the evolution to different conceptual model characteristics (quality, utility, formality, abstractness), etc.
• Process Activity Information Flow	Information from P2.1 – Conceptual Model Requirement Specification and from external information pools flows into this activity. Information from this activity flows into the preliminary conceptual model design and eventually into P4.1 – Conceptual Model Design if selected.
Associated Entities	
• Tools	No custom tools.
• Actor-Agents	• Producer. • Conceptual model developer.
• Information Pools	Information pools relevant to this activity include: • P2.1 – Conceptual Model Requirement Specification, preliminary conceptual model design, preliminary conceptual model, existing conceptual models. • Conceptual models that have relevance in the mission space. • Expected views driven by Stakeholder roles.
• Product / Object / Artefacts	This Process Activity contributes to a preliminary conceptual model design.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • Some (not necessarily all or definitely) conceptual models have been found and recorded to the preliminary conceptual model design.

Table G-17: Conceptual Model Process Activity 4.2 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA4.2 – Identify and Select Conceptual Primitives and Model Kinds to Represent Acquired Knowledge.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is necessary to select suitable conceptual primitives that will capture the knowledge elements and model kinds that will organize the conceptual primitives. This activity is necessary to be intentionally selective on the conceptual primitive and model kind options. This activity is an investment against the risk of uninformed use of conceptual primitives and model kinds.

Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activities, availability of information and establishment of operational capability: • May begin when PA2.3 has substantial progress and P2.1 – Conceptual Model Requirement Specification has valuable input.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • Parse P2.1 – Conceptual Model Requirement Specification to become acquainted with the type of knowledge to be captured and organized. • Analyze conceptual model characteristics requirements from P2.1 – Conceptual Model Requirement Specification to derive the implications on conceptual primitives and model kinds. • Survey conceptual primitive and model kind options either from the literature or from experience. • Make an elective choice of conceptual primitives and model kinds that suit the requirements and that make a coherent conceptual model composite combination. • If views have been selected in the preliminary conceptual model design, select model kinds that represent these views. • If model kinds have been selected in the preliminary conceptual model design, select conceptual primitives that compose these model kinds. • If conceptual primitives have been selected in the preliminary conceptual model design, select model kinds that will use these conceptual primitives. • Record or update the selected conceptual primitives and model kinds in a preliminary conceptual model design artefact.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Executed at least once and may be executed iteratively after new inputs to the preliminary conceptual model design during PA4.1, PA4.3, PA4.4 or PA4.5 or after the failure to meet the conceptual model requirements during PA4.6 evaluation or after the addition of requirements in P2.1 from either some build experience in PA5.1, the arrival of new stakeholders, the evolution to different conceptual model characteristics (quality, utility, formality, abstractness), etc.

• Process Activity Information Flow	Information from P2.1 – Conceptual Model Requirement Specification and from external information pools flows into this activity. Information from this activity flows into the preliminary conceptual model design and eventually into P4.1 – Conceptual Model Design.
Associated Entities	
• Tools	Specific modeling tools can help to select coherent conceptual model composite combinations. Tool availability is likely to influence the design choices.
• Actor-Agents	Producer.
• Information Pools	Information pools relevant to this activity include: • P2.1 – Conceptual Model Requirement Specification. • Preliminary conceptual model design. • Preliminary conceptual model. • Existing conceptual models. • Literature on conceptual primitives and model kinds.
• Product / Object / Artefacts	This Process Activity contributes to a preliminary conceptual model design.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • Some (not necessarily all or definitely) conceptual primitives and model kinds have been selected and recorded to the preliminary conceptual model design.

Table G-18: Conceptual Model Process Activity 4.3 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA4.3 – Select Formalism(s) for Conceptual Model Specification.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is necessary to select the formalism(s) that will be followed in the build process. This activity is necessary to be intentionally selective on the formalism options. This activity is an investment against the risk of uninformed use of formalisms.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activities, availability of information and establishment of operational capability:

• Entrance Criteria (cont'd)	• May begin when PA2.3 has substantial progress. • P2.1 – Conceptual Model Requirement Specification has valuable input.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • Parse P2.1 – Conceptual Model Requirement Specification to become acquainted with the type of knowledge to be modeled. • Analyze conceptual model characteristics requirements from P2.1 – Conceptual Model Requirement Specification to derive the implications on formalisms. • If a formalism has been mandated by policies, record it to the preliminary conceptual model design. • Survey formalism options either from the literature or from experience. • Analyze the preliminary conceptual model design to derive appropriate formalisms to fit the conceptual primitives, model kinds and views. • Make an elective choice of formalism(s) that suit the requirements and that make a coherent conceptual model composite combination. • Record or update the selected formalism(s) in the preliminary conceptual model design artefact.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Executed at least once and may be executed iteratively after new inputs to the preliminary conceptual model design during PA4.1, PA4.2, PA4.3 or PA4.5 or after the failure to meet the conceptual model requirements during PA4.6 evaluation or after the addition of requirements in P2.1 from either some build experience in PA5.1, the arrival of new stakeholders, the evolution to different conceptual model characteristics (quality, utility, formality, abstractness), etc.
• Process Activity Information Flow	Information from P2.1 – Conceptual Model Requirement Specification and from external information pools flows into this activity. Information from this activity flows into the preliminary conceptual model design and eventually into P4.1 – Conceptual Model Design.
Associated Entities	
• Tools	Specific modeling tools can help to select coherent conceptual model composite combinations. Tool availability is likely to influence the design choices.

• Actor-Agents	Producer.
• Information Pools	Information pools relevant to this activity include: • P2.1 – Conceptual Model Requirement Specification. • Preliminary conceptual model design. • Preliminary conceptual model. • Existing conceptual models, literature on formalisms.
• Product / Object / Artefacts	This Process Activity contributes to a preliminary conceptual model design.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • At least one formalism has been selected and recorded to the preliminary conceptual model design.

Table G-19: Conceptual Model Process Activity 4.4 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA4.4 – Select Views to Support Stakeholders.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is necessary to select the views that will fit the purpose of the different stakeholders.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activities, availability of information and establishment of operational capability: • May begin when PA2.3 has substantial progress and P2.1 – Conceptual Model Requirement Specification has valuable input.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • Parse P2.1 – Conceptual Model Requirement Specification to become acquainted with the type of knowledge to be communicated. • Analyze the stakeholders' view requirements from P2.1 – Conceptual Model Requirement Specification to derive the implications on view selection.

• Process Activity Procedure (cont'd)	• Survey view options either from the literature or from experience. • If formalisms have been selected in the preliminary conceptual model design, analyze the impact of the formalisms on the discretionary specification of views. • Make an elective choice of views that support the stakeholders' requirements. • Record or update the selected views in the preliminary conceptual model design artefact.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Executed at least once and may be executed iteratively after new inputs to the preliminary conceptual model design during PA4.1, PA4.3 or PA4.5 or after the failure to meet the conceptual model requirements during PA4.6 evaluation or after the addition of requirements in P2.1 from either some build experience in PA5.1, the arrival of new stakeholders, the evolution to different conceptual model characteristics (quality, utility, formality, abstractness), etc.
• Process Activity Information Flow	Information from P2.1 – Conceptual Model Requirement Specification and from external information pools flows into this activity. Information from this activity flows into the preliminary conceptual model design and eventually into P4.1 – Conceptual Model Design.
Associated Entities	
• Tools	Specific modeling tools can help to select coherent conceptual model composite combinations. Tool availability is likely to influence the design choices.
• Actor-Agents	Producer.
• Information Pools	Information pools relevant to this activity include: • P2.1 – Conceptual Model Requirement Specification. • Preliminary conceptual model design. • Preliminary conceptual model. • Existing conceptual models. • Literature on views.
• Product / Object / Artefacts	This Process Activity contributes to the preliminary conceptual model design.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • At least one view has been selected and recorded to the preliminary conceptual model design.

Table G-20: Conceptual Model Process Activity 4.5 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA4.5 – Select a Notation Suitable to Express the Chosen Formalism.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is necessary to select a notation to express the conceptual primitives, model kinds, views and formalisms. This activity is necessary to be intentionally selective on the notation options. This activity is an investment against the risk of uninformed use of notations.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consist of the completion of the following activities, availability of information and establishment of operational capability: May begin when PA2.3 has substantial progress; P2.1 – Conceptual Model Requirement Specification has valuable input.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • Analyze the preliminary conceptual model design to identify which conceptual primitives, model kinds and formalisms must be supported by the notation. • Survey notations options either from the literature or from experience. • Make an elective choice of notations(s) in accordance with the conceptual model characteristics from P2.1 – Conceptual Model Requirement Specification. • Record or update the selected notation(s) in the preliminary conceptual model design artefact.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Executed at least once and may be executed iteratively after new inputs to the preliminary conceptual model design during PA4.1, PA4.2 or PA4.3 or after the failure to meet the conceptual model requirements during PA4.6 evaluation or after the addition of requirements in P2.1 from either some build experience in PA5.1, the arrival of new stakeholders, the evolution to different conceptual model characteristics (quality, utility, formality, abstractness), etc.

• Process Activity Information Flow	Information from P2.1 – Conceptual Model Requirement Specification and from external information pools flows into this activity. Information from this activity flows into the preliminary conceptual model design and eventually into P4.1 – Conceptual Model Design.
Associated Entities	
• Tools	Specific modeling tools can help to select coherent conceptual model composite combinations. Tool availability is likely to influence the design choices.
• Actor-Agents	Producer.
• Information Pools	Information pools relevant to this activity include: • P2.1 – Conceptual Model Requirement Specification. • Preliminary conceptual model design. • Preliminary conceptual model. • Existing conceptual models. • Literature on views.
• Product / Object / Artefacts	This Process Activity contributes to a preliminary conceptual model design.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • At least one notation has been selected and recorded to the preliminary conceptual model design.

Table G-21: Conceptual Model Process Activity 4.6 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA4.6 – Evaluate Design for Adequacy/Relevance with Respect to Requirements.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	This activity is necessary for verifying whether conceptual model requirements have been met by the conceptual model design.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activities, availability of information and establishment of operational capability: • P2.1 – Conceptual Model Requirement Specification.

• Entrance Criteria (cont'd)	• The preliminary conceptual model design. • The V&V argumentation framework.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITY establish the context within which the bulk of direct conceptual model population will occur: • Parse P2.1 – Conceptual Model Requirement Specification to become acquainted with what design characteristics are required. • Parse the Preliminary conceptual model Design and check whether all conceptual model compositions have been identified. • Part of the V&V argumentation framework is concerned with the quality of the design of the conceptual model. These topics must be specified and transformed into design quality criteria, such as whether all views needed by the stakeholders are available or whether the chosen formalism is capable of expressing the conceptual model. • For each design quality criterion, evidence must be obtained. • Finally, update the design characteristics in the conceptual model data and publish the conceptual model design.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Perform after the PA4.1 – PA4.5 activities have finished.
• Process Activity Information Flow	Preliminary design whether the conceptual model Design meets the conceptual model requirements and accepts the conceptual model design.
Associated Entities	
• Tools	Book keeping aids like requirements tools.
• Actor-Agents	Producer.
• Information Pools	Information pools relevant to this activity include: • P2.1 – Conceptual Model Requirement Specification. • Preliminary conceptual model design. • The preliminary conceptual model.
• Product / Object / Artefacts	Verified conceptual model design and conceptual model Meta data.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • When conceptual model design meets the conceptual model requirements and when P4.1 is complete.

Table G-22: Conceptual Model Process Activity 5.1 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA5.1 – Populate the Conceptual Model Using the Chosen Primitives, Model Kinds, Formalism, and Notation.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	Given information contained in P3.1 – Validated Knowledge and P4.1 – Model Design; it is necessary to compile a (DRAFT or FINAL) version of the preliminary conceptual model. This process step is critical to the generation of the Process Phase 5 final work-product P5.1 – Conceptual Model insofar as it constitutes the accumulation, binding, and permanent authoritative documentation of the desired complete and consistent conceptual model itself, relevant to the military mission space intending to be represented in the pursuant model or simulation, in a preliminary form, pending articulation and confirmation to yield the final conceptual model artefact. The fundamental motivation of this process step is to capture in concrete, persistent form the entire STRUCTURE and PROCESS entailed in the mission space in detail, scope, and fidelity appropriate to the intended use of the conceptual model.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the completion of the following activities, availability of information and establishment of operational capability: • Completion of previous activities (namely Process Phase 3 and Process Phase 4), and availability in DRAFT or FINAL form of their work-products (i.e., P3.1 – Validated Knowledge and P4.1 – Conceptual Model Design). • Establishment of conceptual model drafting Group. • Planning of effort entailed in PP5 Activity.
Process Activity Method	
• Process Activity Procedure	The following PRELIMINARY or PREFATORY ACTIVITIES establish the context within which the bulk of direct conceptual model population will occur: • Build strategy – Establish the style of operation by the Group, election of alternative design options not otherwise bound by requirements, and establishing such stylistic conventions as may facilitate cooperation and efficiency of the Group. Build versions may be spiral so that a succession of products is generated progressively converging on the desired result. Alternatively,

• Process Activity Procedure (cont'd)	parallelization techniques such as partitioning the mission space, allocating model constructs (i.e., primitives or model kinds) to Group members of the group may be convenient. • Notation – Establish election of alternative options for Primitives, Model kinds, Formalisms and Notation which may persist, consistent with P4.1 – Conceptual Model Design specified constraints may be necessary. These determinations and such style conventions to be shared across the Group should be established by consensus before significant build composition effort is begun. Checking the implications of such determinations during first spiral reviews will reassure the Group of the wisdom of its choices. • Sufficiency Criteria – Establish agreement upon prefatory interpretation of sufficiency criteria for the expected product, cast in terms of easily observable and confirmable product characteristics and evidently correlated to requirements specification elements will provide insurance against shortfalls in product quality in areas such as detail and completeness (scope, entities, entity-attribute and entity-relationships) as specified. • Tools – Select and provide prompt access to sufficient Tools to the conceptual model population Group. Selection of such tools should be made carefully with consideration for: a) familiarity and competence of Group, b) power to meet conceptual design capture and specification, and c) facility to generate views and published data products acceptable to customer user stakeholders. • Documentation – Establish Product Document management process and information storage and retrieval sufficient to contain the evolving conceptual model work-product, control of its authoritative configuration and containing commentary on tactical decisions – just as is prudent for requirements or code management under other circumstances. The following EXECUTION ACTIVITIES constitute the bulk of the conceptual model composition effort – to be executed with information contained in P3.1 – Validated Knowledge, in accordance with the constraints manifest in P4.1 – Conceptual Model Design, commensurate with the build strategy and manifesting the notational conventions previously agreed-upon: • Designate object entities.

• Process Activity Procedure (cont'd)	• Designate entity class abstractions. • Designate entity class or entity object attributes or predicates. • Designate entity class and entity object methods or operational processes. • Designate static relationships among object entities and object classes including typically inheritance (e.g., specialization-abstraction), logical (e.g., causal), process subordination or composition and structural composition relationships. • Designate dynamic relationships associated with object entities and classes, including typically state transition, event trace, information flow and interface, and activity control relationships. Please NOTE that the enumeration of activity elements cited above is not guaranteed to be complete or fully systematic, notwithstanding its being characteristic of guidance provided in respected literature and commonly observed in practice. It should, in its entirety, however, provide procedurally concrete guidance to the conceptual model population practitioner In addition, the vernacular used in the operational guidance, while somewhat particular, should not be interpreted as limiting or constraining in any way the determinations made *a priori* regarding "Primitives, Model kinds, Formalisms and Notation " Instead, they should be considered a good faith attempt to indicate in unbiased form the effort-elements recommended to capture a reasonable preliminary conceptual model population.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Process Build Strategy – <see above>. Process Step Iteration – <see above>. Process Step Parallelization – <see above>.
• Process Activity Information Flow	Contingent guidance on Process Activity sequence and control flow above, the following guidance is provided: • Collaboration – During execution, conduct of Group reviews of work progress, product convergence according to build strategies, and product quality should compliment normal program reviews and control mechanisms. Cultivation of consistency of vision across the conceptual model build Group is a powerful mechanism to maintain consistency of product, and collaboration among Group members. • Upstream – Knowledge/Design providers, Stakeholders – essential to compliance.

• Process Activity Information Flow (cont'd)	• Within activities – Population Group cohort … essential to convergence and consistency of product. • To product – Preliminary conceptual model as official record of original entry… essential to closure.
Associated Entities	

• Tools	Notational Standards – Information and notational standards assets likely to support the subject activity include, for:
	• Process-Perspective:
	  • IDEF 0.
	  • Petri Net.
	  • …
	• Object-Perspective:
	  • UML.
	  • SYSML.
	  • IDEF-4.
	  • Resource Description Frameworks (XML/RDF/RDFS).
	  • Meta Object Facility (MOF) Core Specification – OMG adopted specification.
	  • …
	• Data/Knowledge/Information-Perspective:
	  • IDEF- 1, 1xKnowledge Interchange Format (KIF).
	  • Open knowledge Base Connectivity Protocol.
	  • Knowledge Representation System (KRS).
	  • SQL.
	  • Entity Relationship Model (ERM)…
	  • …
	• Ontology Perspective:
	  • ISO/IEC 1350 Topic Maps.
	  • OWL.
	  • IDEF 5.
	  • Ontology Interface Layer (OIL).
	  • Ontology Exchange Language (OXL).
	  • Ontolingua.
	  • …
	COTS CASE Tools – Software assets likely to support the subject activity are available from within the assets of four coexisting communities of practice as follows:

• Tools (cont'd)	• Systems Engineering/Architecture – Typical, but not necessarily recommended tools in this category are:
	  • Systems Architect.
	  • Microsoft Visio.
	  • Cradle.
	  • CORE.
	  • …
	• Software development – Typical, but not necessarily recommended tools in this category are:
	  • IBM Rational Software Modeler (formerly Rational Rose).
	  • Microsoft Visio.
	  • …
	• Data Engineering – Typical, but not necessarily recommended tools in this category are:
	  • Myriad DBMS assets.
	  • …
	• Ontology and Knowledge Analysis – Typical, but not necessarily recommended tools in this category are:
	  • Apollo.
	  • LinkFactory.
	  • OILdOntoEdit.
	  • Ontolingua Server.
	  • OpenKnoME.
	  • Protégé – 2000.
	  • SymOntoXWebODE.
	  • WebOntoChimera.
	  • FCA-Merge.
	  • PROMPT.
	  • ODEMerge.
	  • …
	NOTE that suitability of tools is strongly contingent upon the *a priori* selection of Primitives, Model kinds, Formalisms and Notation cited above. In particular, tools are invariably notation specific; but their having implicit capability or bias toward one or another set of object- versus process- versus data-orientation and choice of primitives is significant and should not be overlooked.

• Actor-Agents	Agents populating the preliminary conceptual model are typically individuals or a designated Group specifically familiar with the required activities and expected consequential products. Execution – implementation agents must be familiar with a range of optional approaches, competent to execute the designated procedures, and competent to collaborate with other stakeholder role holders to ensure that the process executed and product generated are acceptable for intended use of the prospective conceptual model.
• Information Pools	Information pools relevant to this activity include input data artefacts and preliminary conceptual model product in whole or in part pursuant to the completion of the subject activity. In addition, it is likely that a variety of intermediate information pools will be generated as Group member contributions are generated or partial activity results components are generated in anticipation of compilation of these elements in the DRAFT preliminary conceptual model work-product.
• Product / Object / Artefacts	The principle desired output of the subject activity is the preliminary conceptual model. This product is described in Annex F.
Process Activity Completion	
• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following: • Execution all process steps indicated above. • Generation of a preliminary conceptual model, including intentional bindings of Primitives, Model kinds, Formalisms and Notation; according to an unambiguously specified notational formalism; with the following attributes: • Completeness: • Preliminary conceptual model shall exhaust in scope of its contents the description of mission-space and simulation-space domains. • The model shall contain all the expository features entailed in the notational schema (as tailored) that is used in the capture of the model documentation. • Consistency: • Preliminary conceptual model shall exhibit commensurate detail among its respective conceptual model components. • Expression of the preliminary conceptual model shall be expressed systematically in accord with the notational schema of chosen tools and representational notations.

• Exit Criteria (cont'd)	• Correctness:
	  • Preliminary conceptual model contents shall be plausibly correct in providing representations of mission-space and simulation space domains, contingent execution of VV&A and further credibility determinations and findings to be achieved in following activities.
	• Sufficiency:
	  • Preliminary conceptual model shall be plausibly sufficient for its intended use by each of several stakeholders committed to the subject enterprise.
	Criteria reference "values" for demonstration of satisfactory completion of the subject activity – insofar as they shall be needed in addition to the specific guidance above – shall be established by the conceptual model development Group and made a matter of explicit record in anticipation of the subject completion evaluation.

Table G-23: Conceptual Model Process Activity 5.2 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA5.2 – Create the Specified Views.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	Given information contained in the result of activity PA5.1, e.g., the preliminary conceptual model; it is necessary to elaborate that model by establishing the set of canonical 'views' or perspective of that preliminary conceptual model so that that model's contents may be precisely and thoroughly appreciated by the stakeholder community and in particular so the it may be systematically appreciated and understood consistently by the members of the P5.1 – Conceptual Model product development Group for purposes of execution of activities PA5.2 – PA5.4. Consistent appreciation of the content and significances of the syntax and semantics of the Preliminary conceptual model by all members of the conceptual model development Group is essential to the convergence of the preliminary model to the final conceptual model artefact.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the following activities, availability of information and establishment of operational capability:

• Entrance Criteria (cont'd)	• Completion of the Preliminary conceptual model to the degree that its stability, scope and relevance are evident, *prime facie*, to the conceptual model development Group. • Documentation of the notational schema whereby the Preliminary Conceptual model has been compiled, and publication of tools and associated data interchange schemas known readily to be available for operating upon the contents of the preliminary conceptual model. • Designation of the conceptual model views generation and publication work cadre.
Process Activity Method	
• Process Activity Procedure	The following activities constitute the process whereby the establishment of views reflecting the contents of the Preliminary conceptual model shall be made manifest: • Strategy – Establish systematic strategy and procedures for educing and publishing views from the Preliminary Conceptual Mode. • View Inventory – Select views to be employed in depicting the preliminary Conceptual model. Such views should be assured to support the interests of enterprise stakeholders, but particularly the following: a) VV&A agents, b) Customers and users of the information contained in the conceptual model, and particularly, c) developers of the intended objective simulation system These determinations and such style conventions to be shared across the Group should be established by consensus before significant build composition effort is begun. Checking the implications of such determinations during first spiral reviews will reassure the Group of the wisdom of its choices. • Sufficiency Criteria – Establish agreement upon prefatory interpretation of sufficiency criteria for the expected product, cast in terms of easily observable and confirmable product characteristics and evidently correlated to requirements specification elements will provide insurance against shortfalls in product quality in areas such as detail and completeness (scope, entities, entity-attribute and entity-relationships) as specified. • Tools – Select and provide prompt access to sufficient Tools to the conceptual model view generation Group. Selection of such tools should be made carefully with consideration for: a) familiarity and competence of Group, b) power to meet conceptual design capture and specification, and c) facility to generate views and

• Process Activity Procedure (cont'd)	published data products acceptable to customer user stakeholders. Documentation – establish Product Document management process and information storage and retrieval sufficient to contain the evolving conceptual model view-set work-product, control of its authoritative configuration and containing commentary on tactical decisions – just as is prudent for requirements or code management under other circumstance. The following EXECUTION ACTIVITIES constitute the bulk of the conceptual model view generation effort – to be executed consonant with information contained in the preliminary conceptual model, commensurate with the build strategy, and manifesting the notational conventions previously agreed-upon: • Elect one of the (possibly) several view types identified for this activity. • Using the preliminary conceptual model as a basis for interpretation and representation, generate view components consistent with the view type being addressed, covering the entire scope of the Preliminary Conceptual model and preserving detail contained in the preliminary conceptual model in so far as the subject view allows. Integrate view elements by means of composition, or generalization relationships insofar as the subject view schema allows. • Select another of the intended representation views and repeat as above. When one pass implementing all desired views are completed proceed to next step following. • Conduct systematic cross-reference of view consistency by means suitable to ensure that all vies represent/reflect/ reveal the Preliminary conceptual model consistently and comprehensively. Such cross-reference techniques as are deemed suitable by the conceptual model views generation Group are acceptable, but the following are particularly endorsed: a) thorough reconciliation of representative use case in mission space and simulation space domains, b) reconciliation of views for any such components of the Preliminary conceptual model as may be perceived to have unusually close coupling in object or process terms, c) reconciliation of views for parts of preliminary conceptual model as may be considered particularly significant; that is: those which were unusually difficult to generate originally, those which are perceived to be particularly difficult to understand, and those that are perceived to be particularly relevant to one or another stakeholder.

• Process Activity Procedure (cont'd)	• Document all views generated with qualifying commentary regarding their significance, their relationships, and the use of notational conventions with which they have been conceived and published. Please NOTE that the enumeration of activity elements cited above is not guaranteed to be complete or fully systematic, notwithstanding its being characteristic of guidance provided in respected literature and commonly observed in practice. It should, in its entirety, however, provide procedurally concrete guidance to the conceptual model population practitioner. In addition, the vernacular used in the operational guidance, while somewhat particular, should not be interpreted as limiting or constraining in any way the determinations made *a priori* regarding Conceptual model views. Instead, they should be considered a good faith attempt to indicate in unbiased form the effort-elements recommended to disclose a reasonable preliminary conceptual model population.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Process Build Strategy – <see above>. Process Step Iteration – <see above>. Process Step Parallelization – <see above>.
• Process Activity Information Flow	Contingent guidance on Process Activity sequence and control flow above, the following guidance is provided: • Collaboration – During execution, conduct of Group reviews of work progress, product convergence according to build strategies, and product quality should compliment normal program reviews and control mechanisms. Cultivation of consistency of vision across the conceptual model build Group is a powerful mechanism to maintain consistency of product, and collaboration among Group members. • Upstream – Knowledge/Design providers, Stakeholders – essential to compliance. • Within activities – Population Group cohort … essential to convergence and consistency of product. • To product – Preliminary conceptual model as official record of original entry … essential to closure.
Associated Entities	
• Tools	See discussion of standards and COTS/CASE tools provided in exposition of process step 5.1 above.
• Actor-Agents	Agents producing views of the preliminary conceptual model are typically individuals or a designated Group specifically familiar with the required activities and expected

• Actor-Agents (cont'd)	consequential products. Execution – implementation agents must be familiar with a range of optional approaches, competent to execute the designated procedures, and competent to collaborate with other stakeholder role holders to ensure that the process executed and product generated are acceptable for intended use of the prospective conceptual model. Merit exists in choosing views generation agents from the preliminary development Group and from among stakeholders associated with prospective conceptual model verification, validation and use, in order to assure that the most consistent, intelligible and potentially useful suite of conceptual model views is generated by consensus among disparate stakeholder communities.
• Information Pools	Information pools relevant to this activity include input data artefacts and preliminary conceptual model product in whole or in part pursuant to the completion of the subject activity. In addition, it is likely that a variety of intermediate information pools will be generated as Group member contributions are generated or partial activity results components are generated in anticipation of compilation of these elements in the DRAFT preliminary conceptual model work-product.
• Product / Object / Artefacts	The principle desired output of the subject activity is the suite of expository views of the preliminary conceptual model. This product is described in Annex F.
Process Activity Completion	

• Exit Criteria	Criteria-types for demonstration of satisfactory completion of the subject activity, include the following:
	• Execution all process steps indicated above.
	• Generation of an ensemble of views for the subject preliminary conceptual model, according to an unambiguously specified notational formalism; with the following attributes:
	  • Completeness:
	  • Preliminary conceptual model views shall exhaust in scope of its contents the description of mission-space and simulation-space domains.
	  • The model views shall contain all the expository features entailed in the notational schema (as tailored) that is used in the capture of the model documentation.

• Exit Criteria (cont'd)	• Consistency:
	  • Preliminary conceptual model views shall exhibit commensurate detail among its respective conceptual model components.
	  • Expression of the preliminary conceptual model views shall be expressed systematically in accord with the notational schema of chosen tools and representational notations.
	• Correctness:
	  • Preliminary conceptual model view contents shall be plausibly correct in providing representations of mission-space and simulation space domains, contingent execution of VV&A and further credibility determinations and findings to be achieved in following activities.
	• Sufficiency:
	  • Preliminary conceptual model views shall be plausibly sufficient for its intended use by each of several stakeholders committed to the subject enterprise.
	Criteria reference "values" for demonstration of satisfactory completion of the subject activity – insofar as they shall be needed in addition to the specific guidance above – shall be established by the Conceptual Model development Group and made a matter of explicit record in anticipation of the subject completion evaluation.

Table G-24: Conceptual Model Process Activity 5.3 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA5.3 – Verify Conceptual Model Consistency with Respect to Conceptual Model Design.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	Given information contained in the result of activity PA5.1, e.g., the preliminary conceptual model; it is necessary to establish the credibility and user confidence appropriate to be held in the preliminary conceptual model. On this account, two steps are warranted: verification of the preliminary model in comparison to the conceptual model Design (Product P4.1) and, subsequently, the validation of the preliminary model in comparison to the validated knowledge manifest of the simulation representation and simulation execution domains as Product P3.1. This section addresses the former effort.

Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of the following activities, availability of information and establishment of operational capability: • Completion of the Preliminary conceptual model and its associated views heretofore incorporated, to the degree that its credibility and commensurability to the Conceptual Model Design are evident, *prime facie,* to the conceptual model development group. • Documentation of the verification plan whereby the preliminary conceptual model is to be evaluated, this plan should contain strategies, and procedures whereby the congruity of the preliminary conceptual model and the antecedent Conceptual Model Design is to be demonstrated. • Designation of the Conceptual Model verification evaluation and publication work cadre.
Process Activity Method	
• Process Activity Procedure	The fundamental nature of verification of a subject artefact (here, the preliminary Conceptual Model) to a referent information source (here, the content of the P4.1 – Conceptual Model Design), entails corroboration of conformance of the former in its structure, attributes and (functionality) to the informational content of the latter. Procedural guidance for verification execution is highly contingent upon the nature of the subject, the referent, and the intended use of the subject for which verification confirmation is desired. On that count, no more than provisional guidance can be provided here to guide verification execution toward successful conclusion. In fact, however, there exists a copious literature whereby such verification may be conducted. In view of the specialization of VV&A necessary for any particular conceptual model evaluation, and the myriad of techniques for that purpose available in National, and international 'best-practice' guidance (e.g., HLA, NATO); Only precepts, strategic guidance and cautionary instructions are provided in the procedural entries that follow: • Publish and execute a conceptual model verification plan, including specification of: a) verification needs, b) requirements, c) activities, d) data products, e) necessary and sufficient resources, f) management, and g) work-product. • Show rationale whereby planned verification effort devolves and satisfies to a sufficient degree the intention of verification, itself predicated upon appreciation of the intended use of the conceptual model.

• Process Activity Procedure (cont'd)	• Particularly link verification effort to the demonstration of suitable compliance of the preliminary conceptual model to the Conceptual Model Design manifest in the work-product P4.1. • Establish clearly defined verification evaluation components and criteria for satisfaction of verification evaluation component activities. • Report results of verification effort in accordance with description of the Accreditation Report element of conceptual model work produce specified in Annex F. • Coordinate verification plan and results with significant stakeholders.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	Process Build Strategy – <see above>. Process Step Iteration – <see above>. Process Step Parallelization – <see above>.
• Process Activity Information Flow	Contingent guidance on Process Activity sequence and control flow above, the following guidance is provided: • Collaboration – During execution, conduct of Group reviews of work progress, product convergence according to build strategies, and product quality should compliment normal program reviews and control mechanisms. Cultivation of consistency of vision across the Conceptual Model Build Group is a powerful mechanism to maintain consistency of product, and collaboration among Group members. • Upstream – Input from Conceptual Model Design product and product-providers, Stakeholders – essential to compliance. • Within activities – Population Group cohort … essential to convergence and consistency of product. • To product – Preliminary conceptual model or to Conceptual Model Verification Report as official record of original entry is essential to closure.
Associated Entities	
• Tools	See discussion of standards and COTS/CASE tools provided in exposition of process step 5.1 above.
• Actor-Agents	V&V Agents.
• Information Pools	P4.1 – Conceptual Model Design documentation, together with Preliminary conceptual model artefact are information necessary and sufficient to support the completion of this activity.

• Product / Object / Artefacts	While no formal work-product is indicated in the process model as consequent the execution of this activity, it is recommended that a certificate of verification be produced and made a part of the formal documentary conceptual model data package for reference in subsequent VV&A efforts and for reference within the enterprise environment.
Process Activity Completion	
• Exit Criteria	Determination of the adequacy of verification of the conceptual model with regard to consistency with conceptual model design and generation of an authoritative, permanent, accessible record of such verification.

Table G-25: Conceptual Model Process Activity 5.4 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA5.4 – Validate Conceptual Model with Respect to Mission Space and Simulation Space Knowledge.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	Given information contained in the result of activity PA5.1, e.g., the preliminary conceptual model; it is necessary to establish the credibility and user confidence appropriate to be held in the preliminary conceptual model. On this account, two steps are warranted: verification of the preliminary model in comparison to the conceptual model Design (Product P4.1), and, subsequently, the validation of the preliminary model in comparison to the validated knowledge manifest of the simulation representation and simulation execution domains as Product P3.1. This section addresses the latter effort.
Process Activity Initiation	
• Entrance Criteria	Entrance criteria consists of achievement of the following state: • Tasks PA5.1 – 5.3 are complete. • Product P3.1 is available. • Preliminary conceptual model DRAFT is available for evaluation.
Process Activity Method	
• Process Activity Procedure	Execution agent conducts following activity: • Establish rational for validation criteria. • Specify validation criterion sufficiency levels based on state of mission and simulation space knowledge.

• Process Activity Procedure (cont'd)	• Evaluate preliminary conceptual model attributes. • Compare attributes as evaluated to the criterion values previously established. • Document compliance or minimal sufficiency of attributes of the preliminary conceptual model in relation to reference values. • Revise conceptual model (or reconsider mission space and simulation space knowledge formulation and/or contents). • Repeat evaluation step until sufficiency achieved.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This activity follows Activity PA5.3 and subsequent determination of adequacy of the results of that activity. It precedes Activity PA5.6.
• Process Activity Information Flow	Activity uses information from Product P3.1 – Validated Knowledge and provides information to the preliminary conceptual model.
Associated Entities	
• Tools	VV&A tools chosen for use within the enterprise.
• Actor-Agents	V&V agent.
• Information Pools	Information pools relevant to this activity include the preliminary conceptual model and P3.1 – Validated Knowledge.
• Product / Object / Artefacts	None.
Process Activity Completion	
• Exit Criteria	Complete demonstration of satisfaction of attributes of the preliminary conceptual model to criteria derived from.

Table G-26: Conceptual Model Process Activity 5.5 Description.

PROCESS ACTIVITY CHARACTERISTIC	
Process Activity Identity	
• Process Activity Name and Aliases	PA5.5 – Ensure Acceptance of Conceptual Model by Authorized Stakeholders.
Process Activity Description	
• Process Activity Rationale / Need / Motivation	Satisfaction of stakeholders' needs in creation and subsequent utility of conceptual models is the fundamental objective of conceptual model development activity. Confirmation of suitability of the conceptual model work-product with stakeholder(s) authorized to render that judgement is the proximate objective of the effort.

Process Activity Initiation	
• Entrance Criteria	Completion of development Process Activities through PA5.4 and a FINAL DRAFT of the conceptual model, together with associated work-products are necessary pre-conditions for completing this activity.
Process Activity Method	
• Process Activity Procedure	Particular activities considered necessary and sufficient to complete this process step include: • Check for completion of preceding efforts and entrance criteria. • Compile full documentation suite including FINAL DRAFT preliminary conceptual model. • Identify authoritative stakeholder(s) whose approval is considered necessary. • Prepare decision briefing. • Prepare authorization documentation. • Execute decision briefing. • Obtain authorization documentation signature.
Inter Process Activity Relationships	
• Process Activity Sequence and Control-Flow	This Process Activity follows Activity PA5.4 and the adequacy decision following. It is the last step in PP5.
• Process Activity Information Flow	Information flow into this activity includes the FINAL DRAFT preliminary conceptual model as well as any necessary information from preceding information data products generated during the conceptual modeling process Output information includes a formally approved conceptual model designated Product 5.1.
Associated Entities	
• Tools	No special tools required.
• Actor-Agents	Principal actor agents contributing in this activity are the conceptual model development effort program manager (and associated administrative staff) and the designated authoritative Stakeholder(s) whose approval is solicited.
• Information Pools	Preliminary conceptual model and associated collateral documentation.
• Product / Object / Artefacts	P5.1 – Approved Conceptual Model.
Process Activity Completion	
• Exit Criteria	Approval of FINAL DRAFT conceptual model by authoritative stakeholder(s).