Appendix / Definitions

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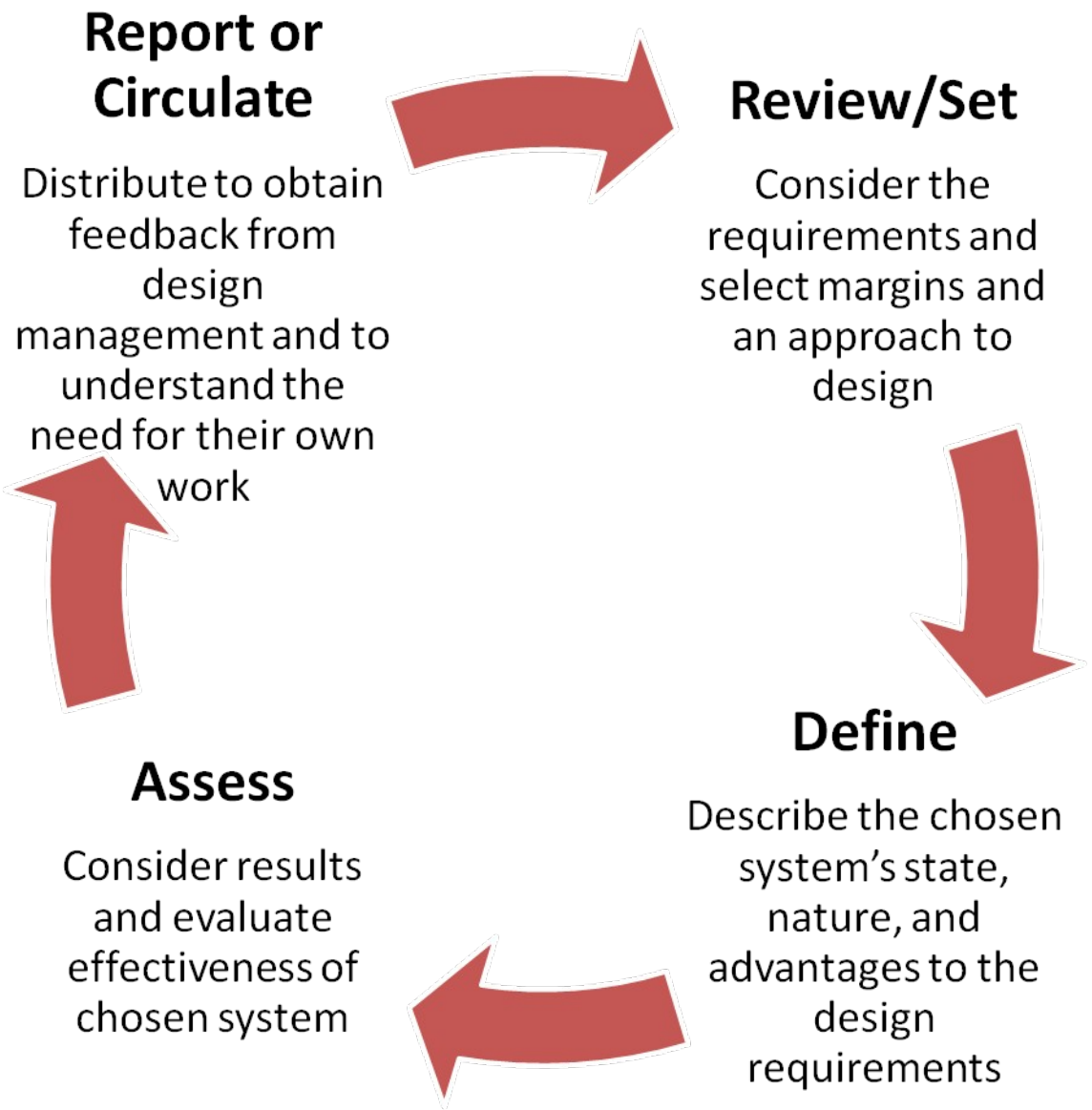
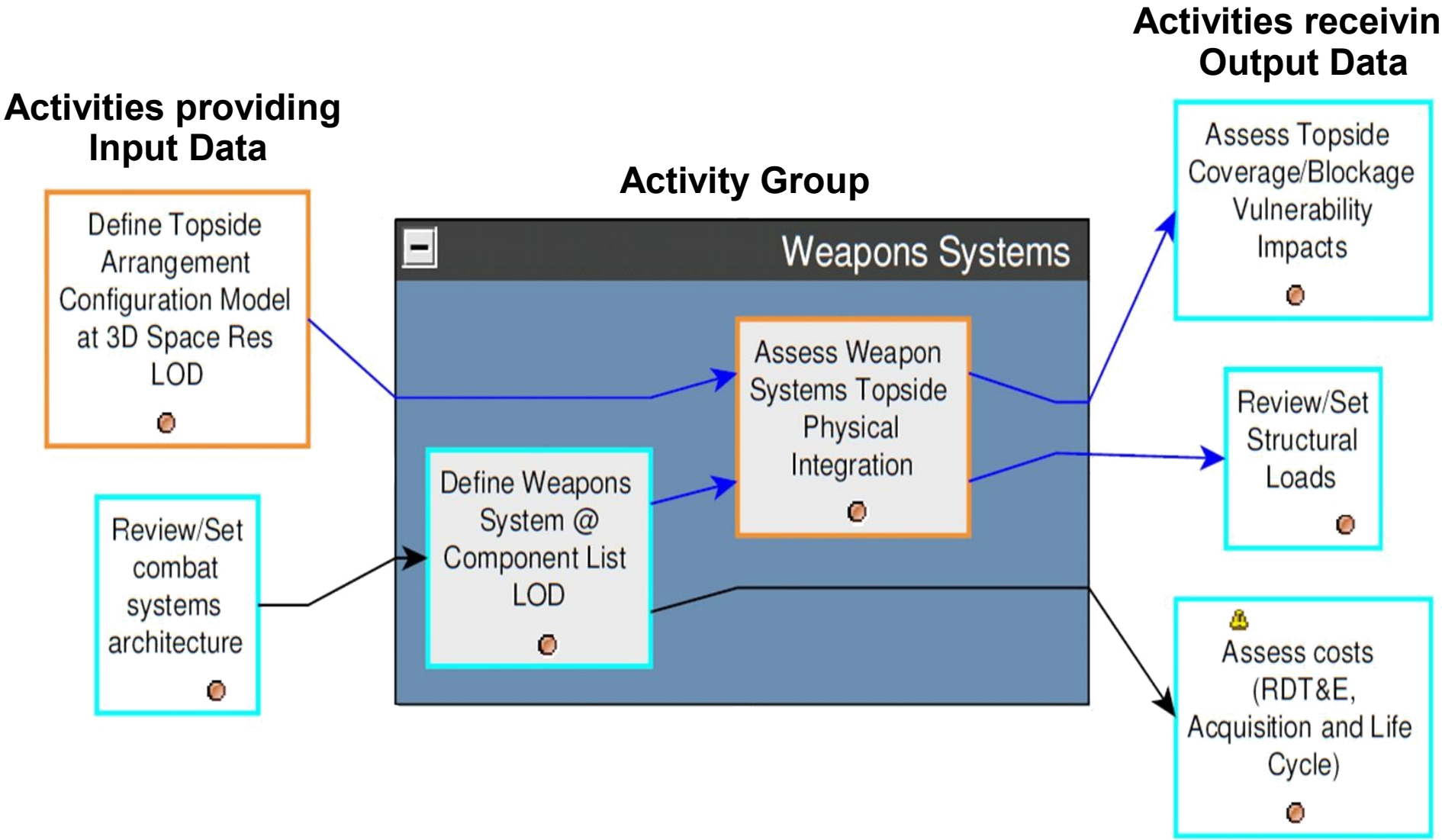
Activity Naming Convention

The consistent naming of activities keeps the process model simple.



Activity Group Input & Output



The Progression of the Levels of Detail

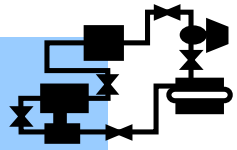
Levels of Detail

Distributive Systems

-Gross level definition of system characteristics based on ship size or similar designs.

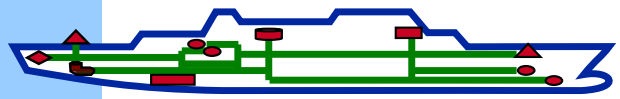
Parametric

The amount of data and detail increases as engineers work with smaller areas of the ship.



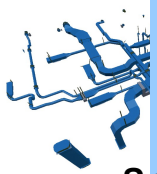
-System network layout and topology

Schematic



Diagramatic

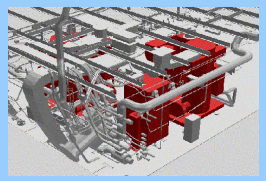
-Schematic level information laid out in 3D ship space



-3D system layout and routing

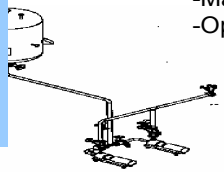
Space Reservation

Distributive systems provide the utilities and infrastructure for the individual subsystems and equipment.

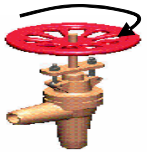


-Assembly drawings
-Work packages

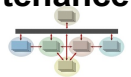
Assembly, Builders Definition, Clearance



-Maintenance Guides
-Operational Manuals



Full Component Breakdown, Maintenance Procedures



Glossary

2.5 Dimensions (2.5D) Arrangement Level of Detail (LOD)	Inboard profile with bulkhead and deck divisions; 2D deck arrangement. Requires 3 Dimensional hull surface.
2.5D Structural Arrangement LOD	Plate thicknesses, stiffener toe traces and scantlings indicated on bulkhead, deck, and plating sketches. Requires 2.5D Arrangement.
3D Space Reservation LOD	3D geometric view of plates, stiffeners, openings, coamings, etc. Requires a 3D arrangement.
3D Surface LOD	Shape of hull is mathematically described as a continuous function; deckhouse shape is similarly described.
3D Surface Plus Appendages LOD	3D surfaces plus appendage definition.
Acceptable Amount of Damage	Amount of damage relative to the damage that will take a ship out of commission.
Air Draft	The height from the water line to the absolute highest point of the vessel including antennas and sensors.
AIREX	Threatening explosions in air
Auxiliary Systems	Systems necessary to the operation of the ship, such as chilled water, ballast systems, etc.

Glossary

Bending Moments	The moment on a ship from non-uniformly distributed buoyancy loads causing hogging or sagging.
Bulkhead	A dividing wall on a ship
C4ISR	Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance
CBR	Chemical, biological and radiological
Combustion Air Arrangement	The layout of the compartments and equipment designated for feeding air into or out of combustion engines.
Component List LOD	Major components listed, including the minimum equipment list (MEL), and combat survivor/evader locator (CSEL).
CSEL	Combat Survivor/Evader Locator
Design Conditions	The conditions the ship will be designed to operate in such as Seastate 5 or hazardous environments (arctic patrol, etc.)
Design Cycle	The process of designing a craft where multiple iterations of design are used to gradually set specifics of the design to greater levels of detail until it *converges,* and the design is complete and consistent.

Glossary

Diagrammatic LOD	Shows all components which are free standing and which are integrated with the ship in the context of the whole ship for any given system. Requires 2.5 Dimensional Arrangement.
Duration	The amount of time and activity will take to be completed from start to finish in the ship design schedule for the number of devoted resources
Electromagnetic radiation efficiency	The ability of the ship to use necessary electromagnetic sensors (e.g. radar) without creating additional unnecessary electromagnetic fields.
EM	Electromagnetic
EMC	Electromagnetic compatibility: the science of eliminating unintentional generation and propagation of EM energy
EMCON	Emissions Control
Endurance	The length of time a ship can stay out to sea without requiring replenishment of tanks and stores.
Emission Controls	Management of the electromagnetic field on board the ship
Exhaust Signature Locking	The ability of a heat seeking weapon to lock onto the heat emitted from the ship's exhaust system.

Glossary

Feasibility Study	The study of a concept for possibility of design, utility, and producibility.
Finite Element Model	A computer model using finite element analysis to approximate partial differential equations to solve the forces along a surface.
Fragmentation	Damage to a ship which causes portions of ship material to break off.
GA	General arrangements
Growth Loads	The possible increases in the load on a ship over time (the service life of 20 to 50 years) due to new technologies, or maintenance and repairs.
HM&E	Hull, mechanical and electrical
Hotel Loads	The electrical load required to support life systems such as lighting, galley equipment, and personal electronics.
Hull and Deckhouse Envelope	The total amount of volume the deckhouse and hull will occupy in space causing a visual and physical obstruction
Hull Geometry Design	The outer shape of the hull
HVAC	Heating, ventilation, and air conditioning
Inboard Profile	A cross-section, lengthwise view at the centerline of the ship showing the vertical placement and layout of all decks looking starboard and port.

Glossary

Intakes	The stacks which bring air into the engine room to supply oxygen to the engines.
IR	Infrared; heat signature
ITD	Integrated Topside Design
Journeyman	A professional who has studied the design process and has participated in the design of a few projects.
Junior	A professional who has studied the design process but lacks a great deal of field experience in design.
KG	Height of the vertical center of gravity above the keel
LAN system	Local Area Network: the hard wired network of computers controlling various systems on board.
LO	Lubrication oil
LOD	Level of Detail
MEL	Minimum equipment list
MMR	Main Machinery Room

Glossary

Moment	The tendency of a force to twist or rotate an object
PD	Preliminary Design
Policy Document	The formal document detailing the policy on a specific topic in an organization. This document generally includes a purpose statement, an applicability and scope statement, an effective date, a responsibilities section, and policy statements.
RadHaz	Radiation hazard
RDT&E	Research, Development, Test, and Evaluation
RM&A	Reliability, maintainability, and availability
Risk	The possibility that some aspect of the ship will not be built to specifications, causing the delivered vessel to operate below expectations.
Roll Up Activities	The culmination and distribution of outputs generated in an activity group
Schematic LOD	An illustration of the spatial relation of components in a system in relation to each other as well as the ship.
Senior	A practicing professional who has participated in many design projects and has a considerable amount of experience in completing the activity assigned

Glossary

Service Life Growth Load Margin	The safety margin added to a design allows for weight growth over the service life of the ship
Severe Operating Conditions	Conditions the ship will need to either operate or survive in, per the design requirements, which can include very high seastates as well as extreme temperatures.
Shear	The force acting over the member cross section resulting from a force applied perpendicular to the cross section's normal.
Ship Originality	A function of how similar the ship is to previous proven designs or the cutting edge technology in equipment or geometries.
Stack Gas	The physical stacks from the engine and fan rooms through the weather deck exchanging gases from the machinery to the atmosphere.
Structural Members	The longitudinal and transverse material which gives strength and rigidity to the ship so it can withstand pressures acting on the ship.
Symbol Diagram	A diagram which uses symbols to show major equipment instead of specific equipment sizing and models.
Torsion Moment	The moment acting on the ship from non-uniform loads causing the ship to twist along the hull longitudinally.
Towed Body Systems	Any array or system which will be pulled in the water aft of the vessel

Glossary

Trade Off Studies	An in-depth look at the advantages and disadvantages of all design options and the weighing of those advantages to the requirements of the vessel.
Trail Shaft	The process of saving fuel by running only one motor and one propeller.
Transmission Reduction Gear Size	The gear used in the propulsor engine system to reduce the rotational speed of the engine to the necessary rotational speed of the propulsor.
Resource Tool	Software used to aid a designer, including spreadsheets, analysis software and computer assisted design (CAD) software (for graphical design).
Ultimate Strength	The material property which is the maximum load the material can withstand before breaking.
UNDEX	Threatening explosions underwater
UNREP	Underway replenishment
Uptake	The stacks which remove hot air and exhaust from the engine room and vent it to the atmosphere.
Whipping Damage	Damage to the hull structure resulting from large magnitude and quickly changing bending moments