**Summary:**

Outline for how the game AI assesses the tactical and strategic situation for a turn and creates tactics and strategies to meet objectives. Units should follow a general chain of command system and have orders relayed based on these objectives where appropriate for the unit.

Order of precedence for general strategic goals:

* *Defense of held areas: 1*
* *Attacking enemy areas: 2*
* *Attacking enemy units: 3*
* *Scout areas (find hidden enemy forces): 4 [not yet implemented]*

Units that will NOT be selected for general strategy tasks:

* Critically low on fuel
* ?

For AI to determine actions we will break down the hierarchy in the following order:

***Tactics => Missions => Tasks***

**Strategy**

General stance. Comprised of one or more ***Tactics***. Assessed by the AI based on the overall state of the board or area of the board and on analyses of opponent actions. Strategies are not represented as a component type, but is a meta term to describe a particular group of tactics and the general stance that group comprises.

The general stance should be selected based on (in priority order):

1. Comparative unit count between factions
   1. Count above threshold range - generally offensive
   2. Count below threshold range - generally defensive
   3. Count within threshold range – mix [maybe based on a sliding scale within the range]
2. Comparative unit count to victory condition
   1. Count above threshold range – generally defensive
   2. Count below threshold range – generally offensive
   3. Count within threshold range – mix
3. Victory point count (if victory points are a condition)
   1. Count above threshold range – generally defensive
   2. Count below threshold range – generally offensive
   3. Count within threshold range – opportunistic
4. Comparative reinforcement points
   1. Opportunistic

*Threshold example: victory points*

*0(min) – victory condition value 40(max) with 40% configured threshold range.*

* *0 – 12 LOW (below range)*
* *28 – 40 HIGH (above range)*
* *13 – 27 MID (within range)*

*Threshold example: unit counts between factions*

*Faction A has 32 units; Faction B has 40 units with 40% configured threshold range. Current enemy count is considered as mid-range. Therefore, for Faction A:*

* *<32 LOW (below range)*
* *32 – 48 MID (within range)*
* *>48 HIGH (above range)*

**Threat**

*Assessment of localized threats should dictate a more immediate stance. If the threat level is high within a threat range, the AI should assess whether a defensive, offensive or stealth stance is most appropriate. A threat level should be assessable at any given node for a given threat distance (area). Threat level should take into account enemy forces, types, strength comparative to local friendly forces, types, strength and value of current area as a strategic target (current location of accumulative of local area).*

**Opportunity**

*The AI should be continually attempting to gain advantage based on the above criteria observing the order of precedence for the general strategies.*

*E.g.*

* *AI should attempt to gain victory points (aggressive/offensive – attack target) unless a localized threat is assessed (passive/defensive – current location). If the localized threat is assessed to be overwhelming, then stealth or retreat (either current location or retreat target).*
* *AI should attempt to reduce enemy forces where threats or defensive build-ups are assessed. Particularly in areas of high strategic value*
* *AI should attempt to gain control of areas of high strategic value placing priorities on weakest defenses first*

**Tactics**

Outlines maneuvers for overall objectives. Comprised of one or more ***MissionObjectives***.

NOTE: When tactics are assessed, we should track when a tactic fails to gel based on a lack of units (types). We can then use this a part of prioritizing reinforcements during that phase of the AI turn.

* **Offensive**
  + Frontal Assault – standard attack
    - Selection Criteria:
  + Flank
  + Encirclement
  + Raid – Small surgical team behind enemy lines to complete an objective quickly and then be extracted
  + Interdiction – Cutting off support
  + Ambush
  + Breakthrough – Blitz
  + Draw fire
  + Shock and Awe
  + Corner – force the enemy into an inescapable position
* **Defensive**
  + Force Dispersal – Retreat/Hide
  + Fortify
    - Close-in perimeter – High value defensive targets with limited resources and high enemy count
    - Perimeter at distance – High value defensive targets with sufficient resources and high enemy count
    - Close-in single front – Lesser value defensive targets with limited resources and lower enemy count or as needed.
    - Single front at distance – Lesser value defensive targets with sufficient resources and either lower enemy count or higher concentration in a specific direction.
* **Deception**
  + Camouflage – Hide in place
  + Decoy – Attempt to cause enemies to follow a path off the current objective
  + Diversion – Create a distraction at a given area

**MissionObjectives**

Comprised of one or more units performing one or more ***Tasks***. A unit can be given only one mission within a turn.

* Location Attack
* Defend Location
* Scout
* Transport
* Airborne Attack
* Remote Attack
* Reinforce Units
* Reassign Units

**Tasks**

Where the rubber meets the road. These are the orders given to individual units via the ***Mission***. The AI can assign a unit a mission with multiple tasks to attempt as long as the unit rules are obeyed. *E.g. A transport unit may be given a transport mission. This will require the unit to possibly* ***a) Move to Location, b) Load Units, c) Move to Location and d) Deploy Units.***

* Attack
* Defend
* Move To Location
* Load Units
* Deploy Units
* Produce Units
* Assign Units
* Build Infrastructure
* Place Units

**Anatomy of an AI Strategy**

**Situational Assessment**

1. Assess immediate threats
   1. Within threat distance of friendly spaces determined important enough to defend
      1. Considerations
         1. Victory Points
         2. Strategic Importance
         3. Total unit strength at location
         4. Supply
         5. HQ
2. Assess targets
   1. Victory points
   2. Enemy units present
   3. Strategic areas
   4. Perimeters
3. Threats
   1. Buildup of units at location
   2. Buildup of units around location
4. State of forces – reinforce

**Strategic Areas**

**Choke Points**

1. Bridges
2. Narrow waterways
3. Mountain passes
4. Paths through otherwise hindered movement

**Defensible Positions**

1. High defensive modifiers
2. Natural barriers (mountains, rivers)

**Offensive Positions**

1. High offensive modifiers