Decision Support Tools for the Operational Planning Process

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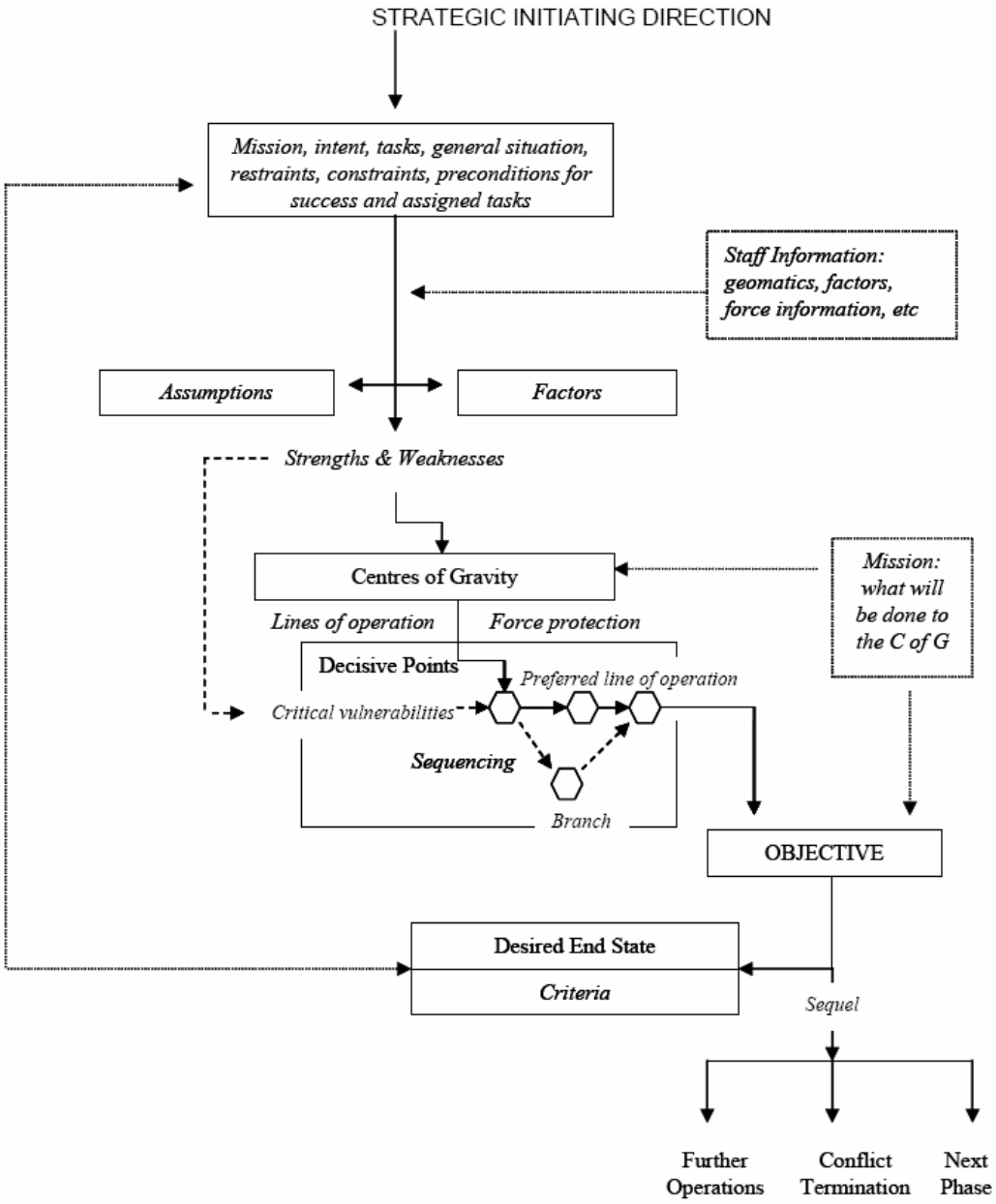
Canada

Outline

- Context of Work
- Collaborative Operations Planning System
- Decision Support Tools
- Conclusion

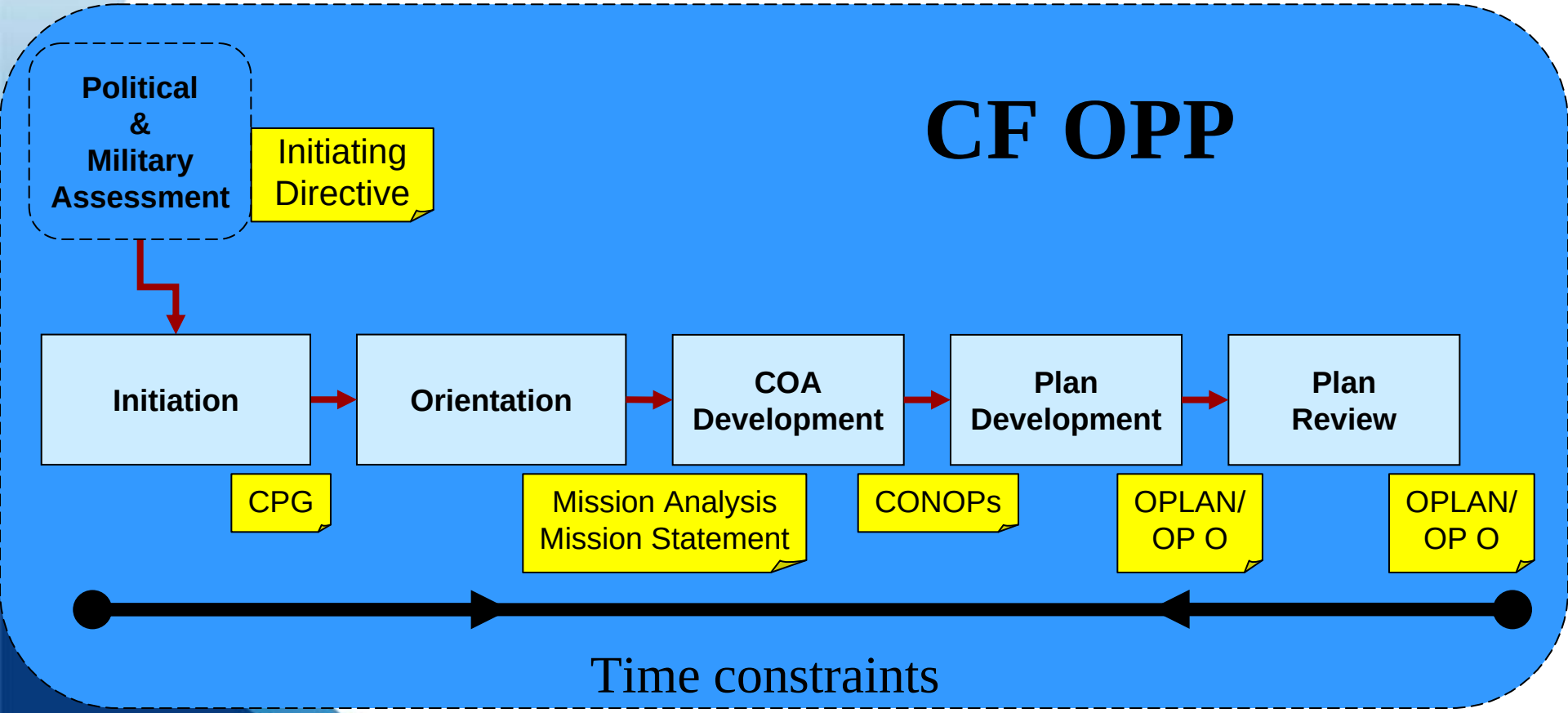
Campaign Planning Tools



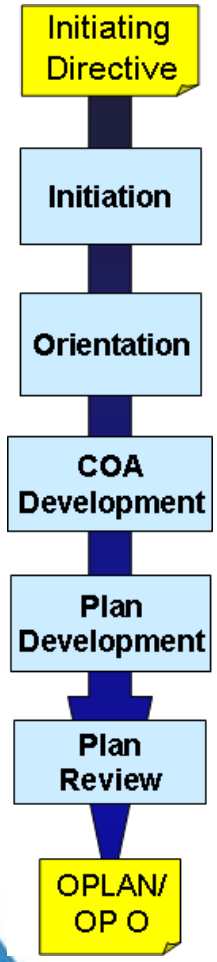
CFOPP

Goal

- Develop and demonstrate concepts supporting time-sensitive operational planning process



Process Support & Collaboration Tools



+

Space

Time

	Same "Asynchronous"	Different "Asynchronous"
Same "Co-located"	Face-to-Face, Voting, Presentation Support, Etc.	E-mail, Voicemail, Document Repositories, Etc.
Different "Virtual"	Video/audio-conferencing, Chat, Instant Messaging, Etc.	E-mail, Threaded Discussions, Document Repositories, Etc.

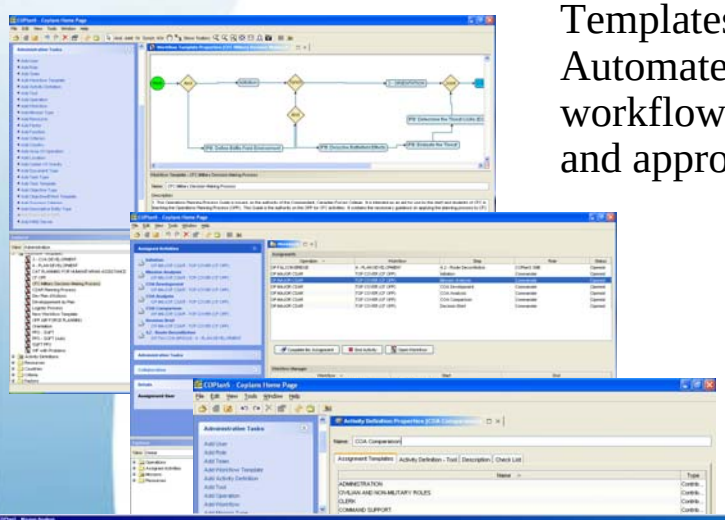
CFOPP

@ Massey 2008

Collaborative Operations Planning System
COPlanS

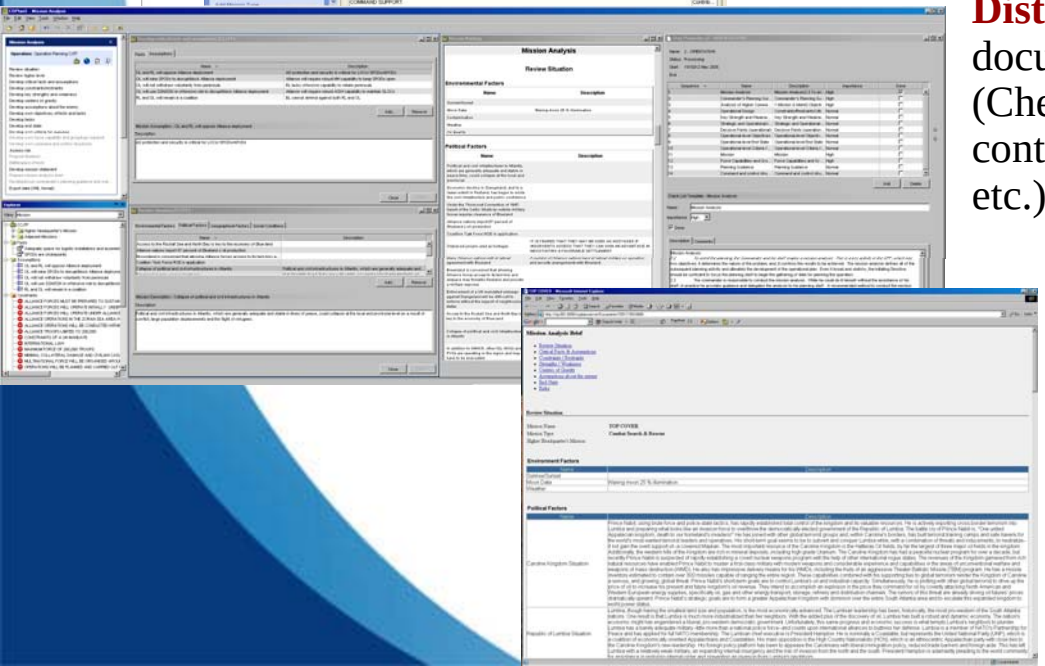
An integrated flexible suite of planning, decision-aid and workflow management tools aimed at supporting Distributed Military Processes (e.g., CFOPP)

Generic Capabilities



Process Management – Graphical Design and implementation of Process Templates (e.g. OPP, Crisis Action Planning and Condensed IPB); Automated Staff Check and Activation; Manage staff, roles, activities and workflows; Manage approval process (brainstorming, revision, pre-approval and approval).

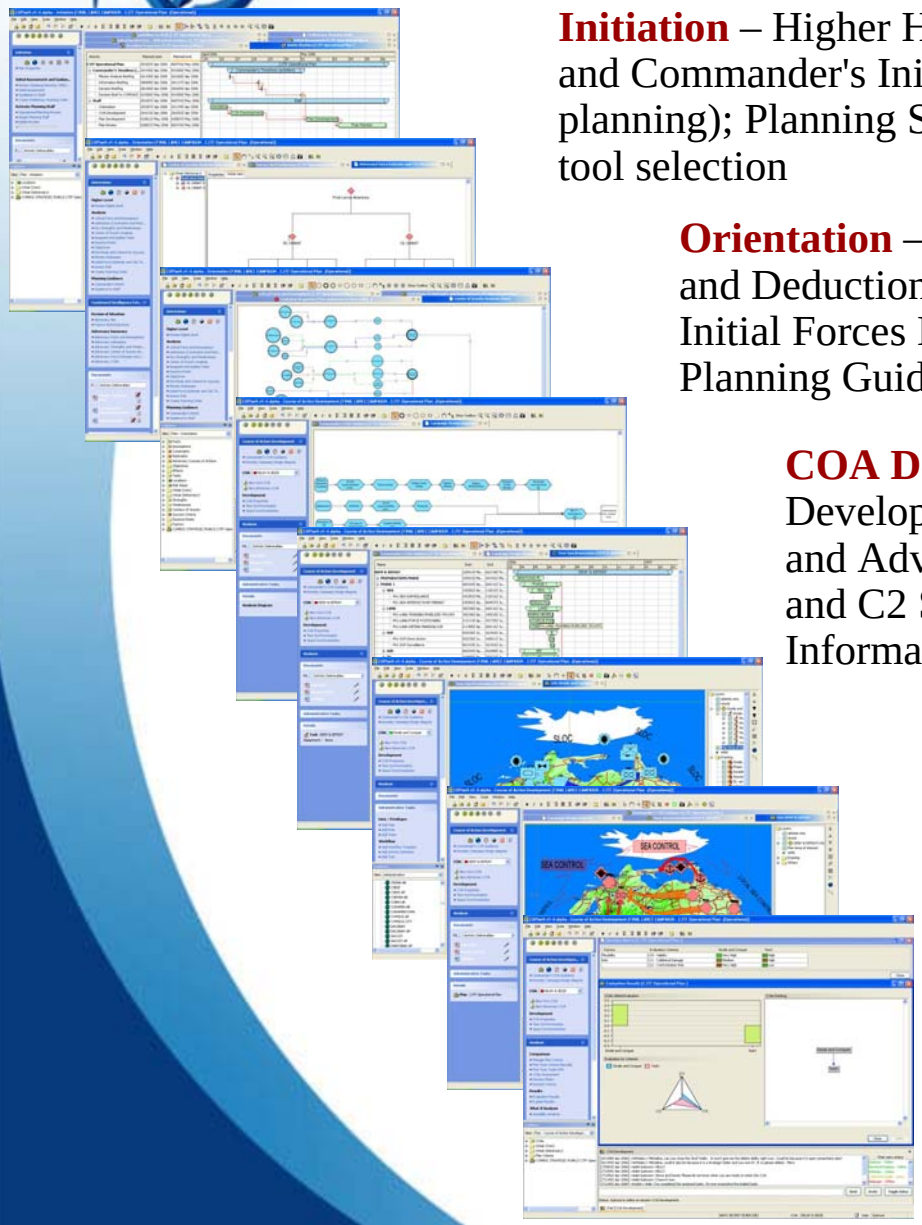
Distributed Collaboration –Distributed Collaborative Workspace with integrated tools foster sharing of data and tools across workgroups / agencies; Direct Conduit to MS Outlook and Exchange Serve; Chat with Possibility to integrate SameTime; Possible Interfacing with VTC



Distributed Document Management – Automated document management; Distributed document editing (Check in/check out); Change Management (Version control); Handle any document format (doc, ppt, avi, etc.);

Automated WEB Master – Self Maintained WEB Consultation Center for Real-Time Information Access; Supports XML/XSL; Document Handling; Possible bridging with CommandView

Enhanced Collaborative OPP Capabilities



Initiation – Higher HQ Initiating Directives Review; Initiation Assessment and Commander's Initial Guidance (Initial Wng O in case of time sensitive planning); Planning Staff Check and Activation; Battle Rhythm; Planning tool selection

Orientation – Provide Condensed IPB Estimates; Staff Estimates and Deductions; Operational Design Support; Strange Analysis; Initial Forces Estimates; Mission Analysis Brief production; Planning Guidance

COA Development – Campaign Designer and Concept Development; Time and Space Synchronization for Friendly and Adversary COAs; OnMap Collaborative Planning; ORBAT and C2 Structuring Tool; Simulation; Analysis; Comparison; Information and Decision Briefs; CONOPs

Plan Development – Automated SOR; OPLAN / Campaign Plan; Management of Annexes; Plan Review; Possibility to redo any step and update any output;

Automated Production – Automated and Tailored reports and outputs information in accordance with organizational templates; Choice of formats; Web Push and Hide; Interoperability

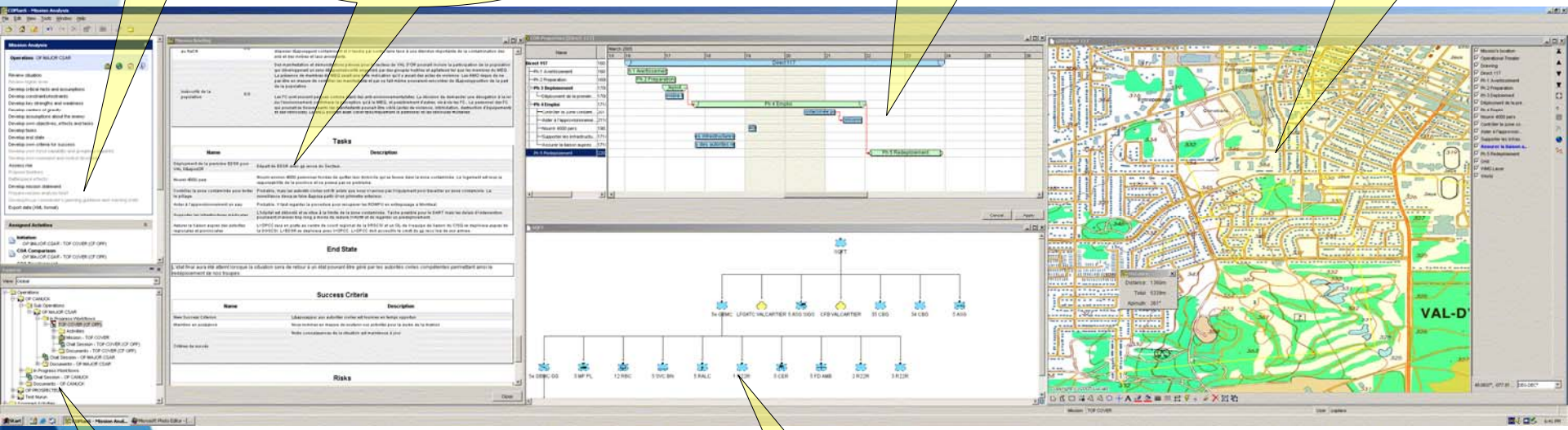
3 Screens Setup (Planning)

Tools Shortcuts

Mission Analysis

COA Synchronization

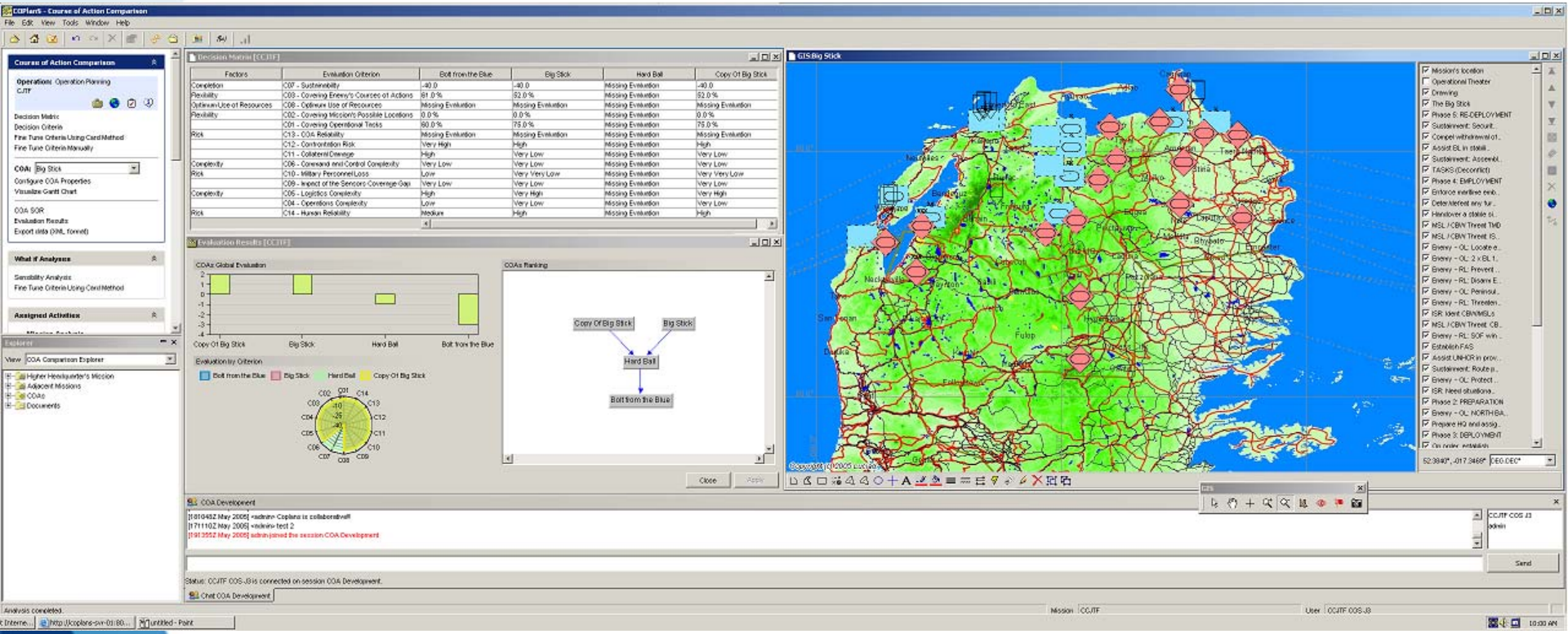
OnMap Planning



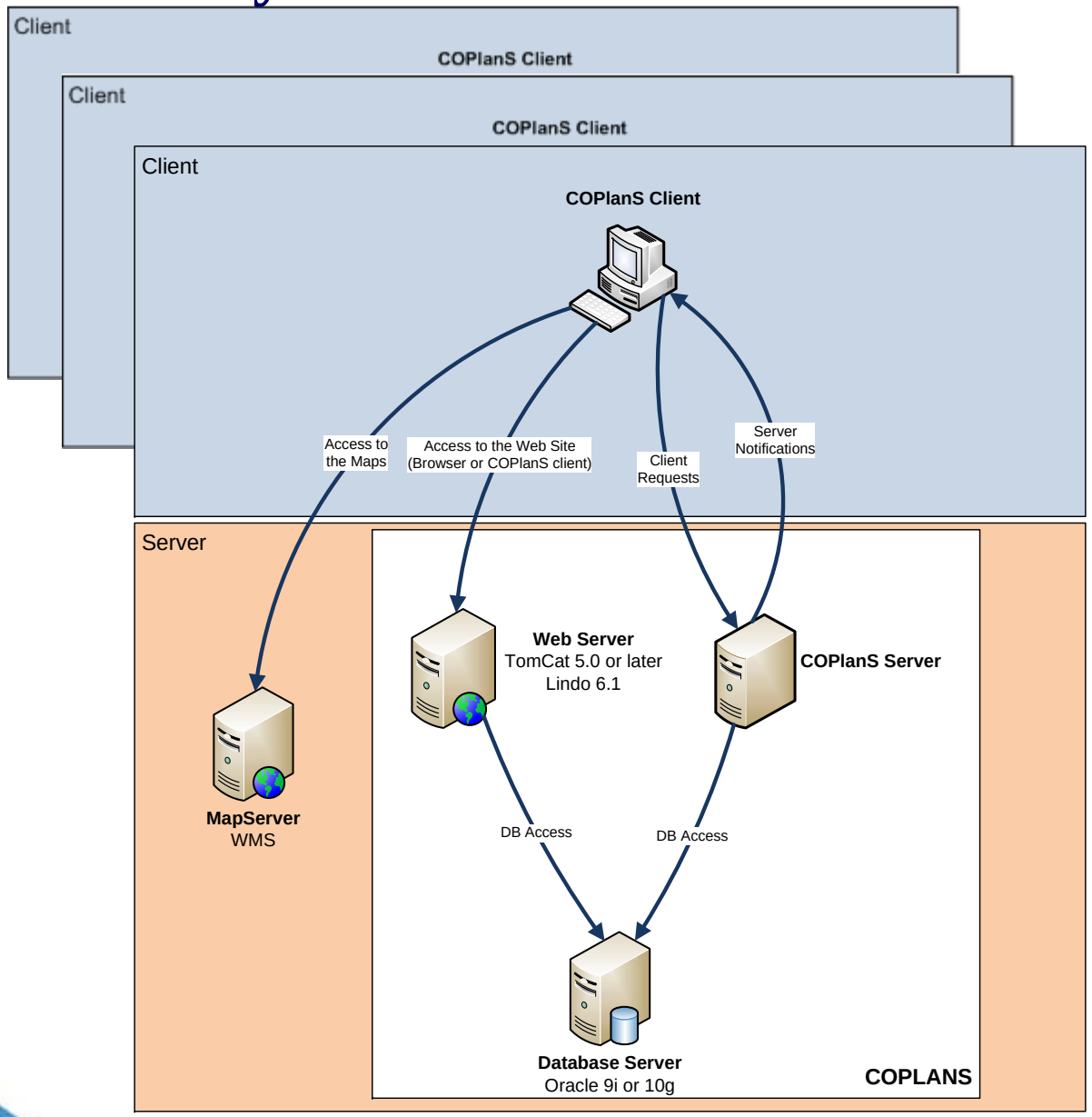
Document Repository

ORBAT Browser

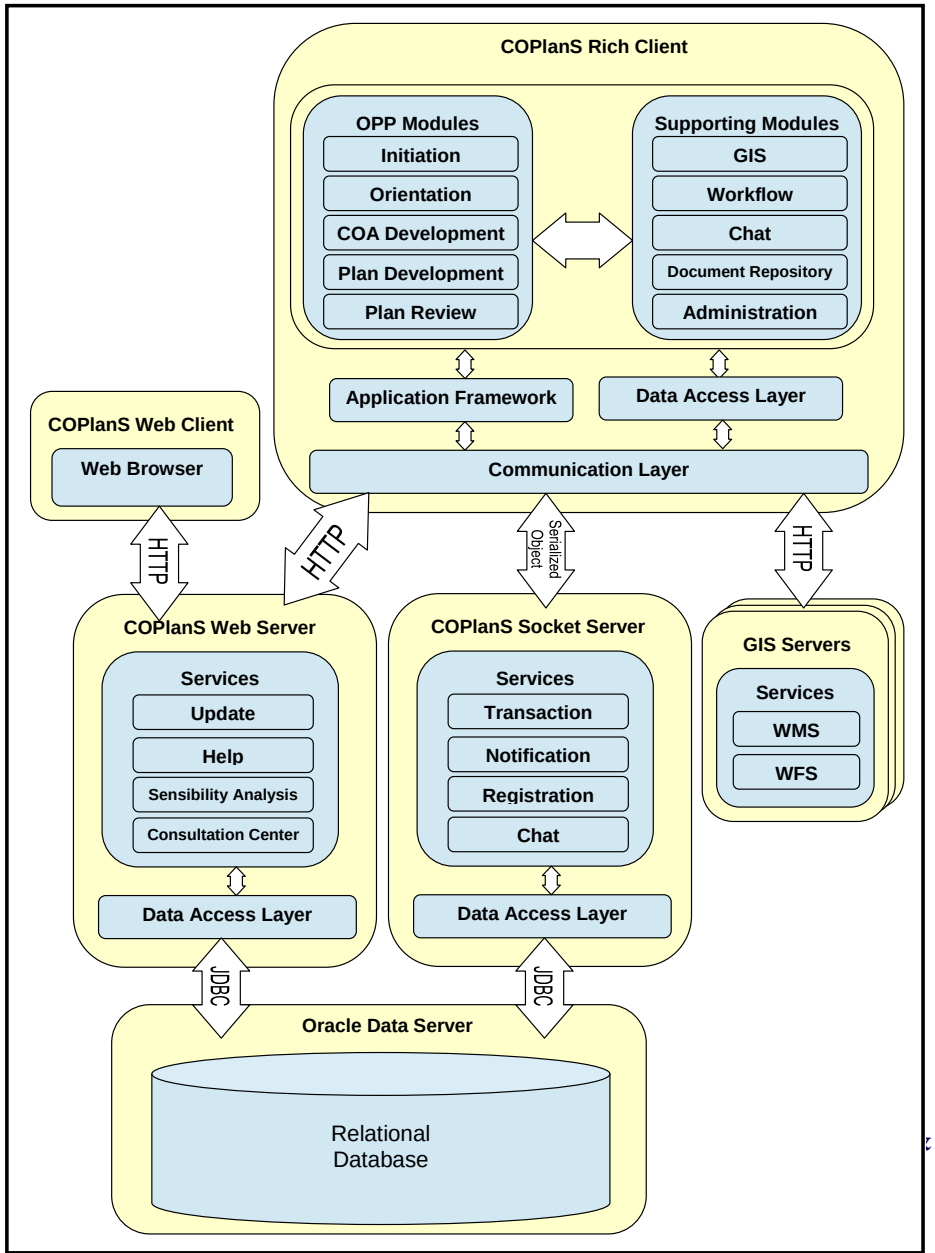
Decision Support

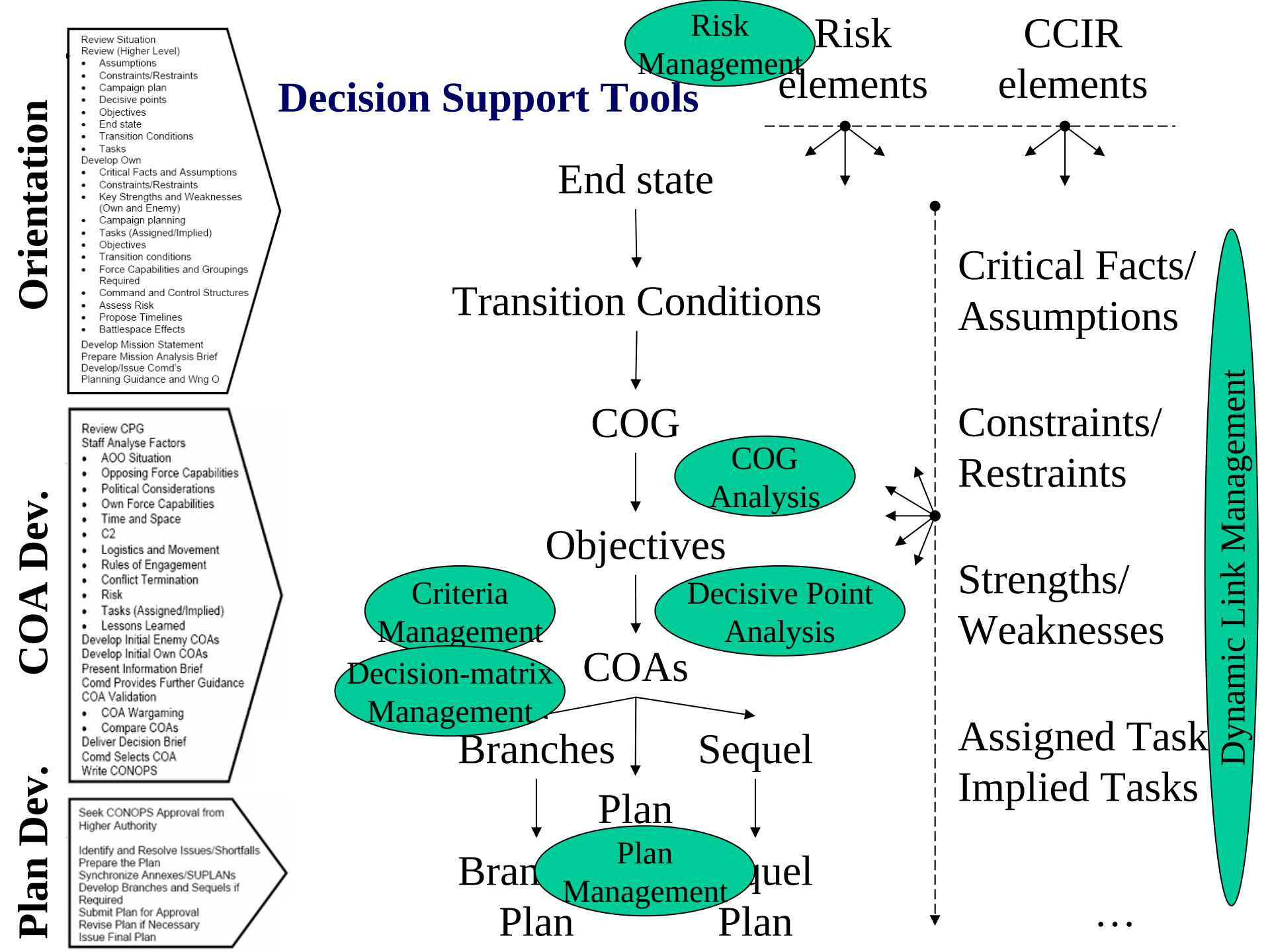


COPlanS System Architecture Overview

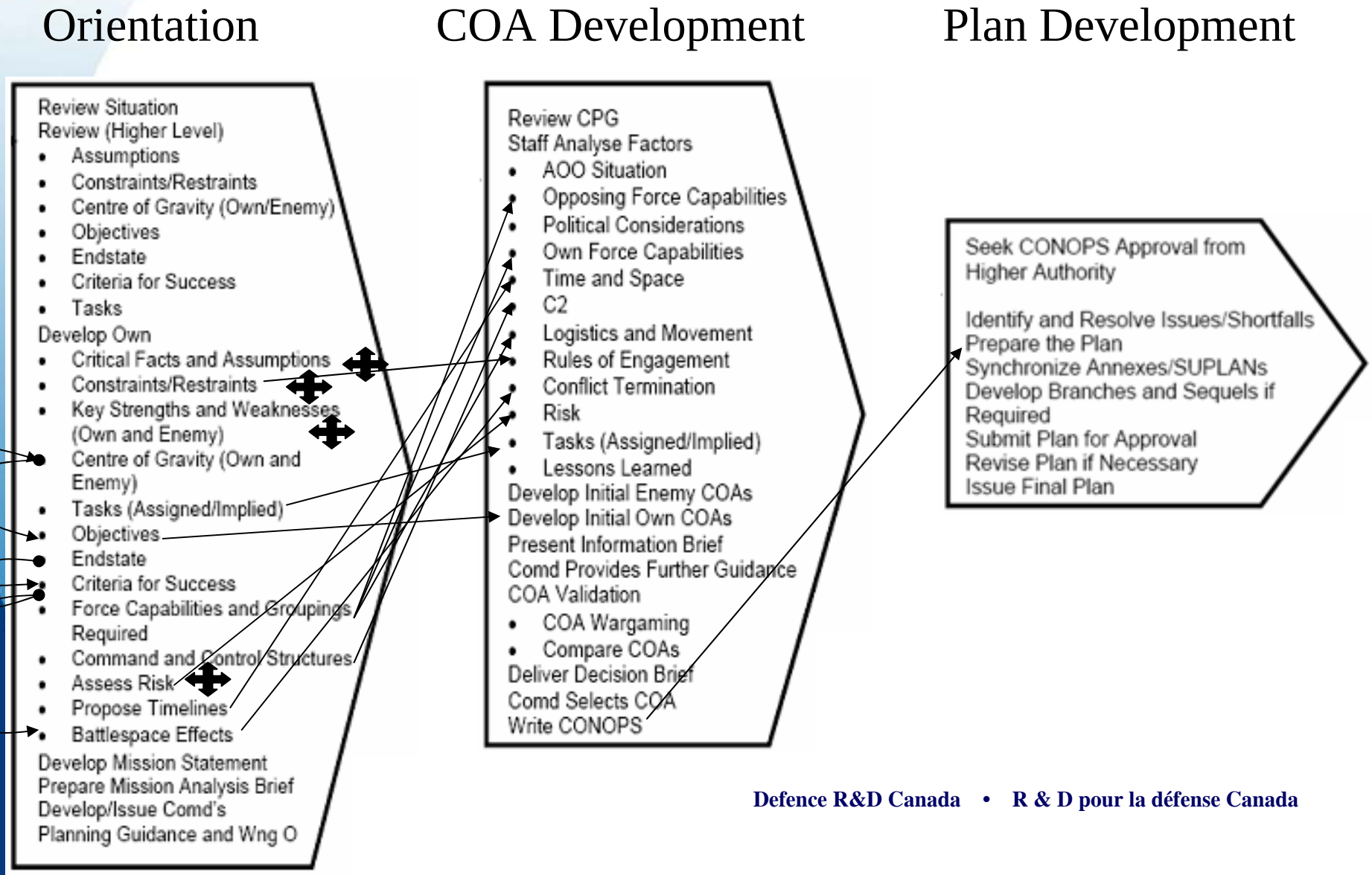


COPlanS Architecture

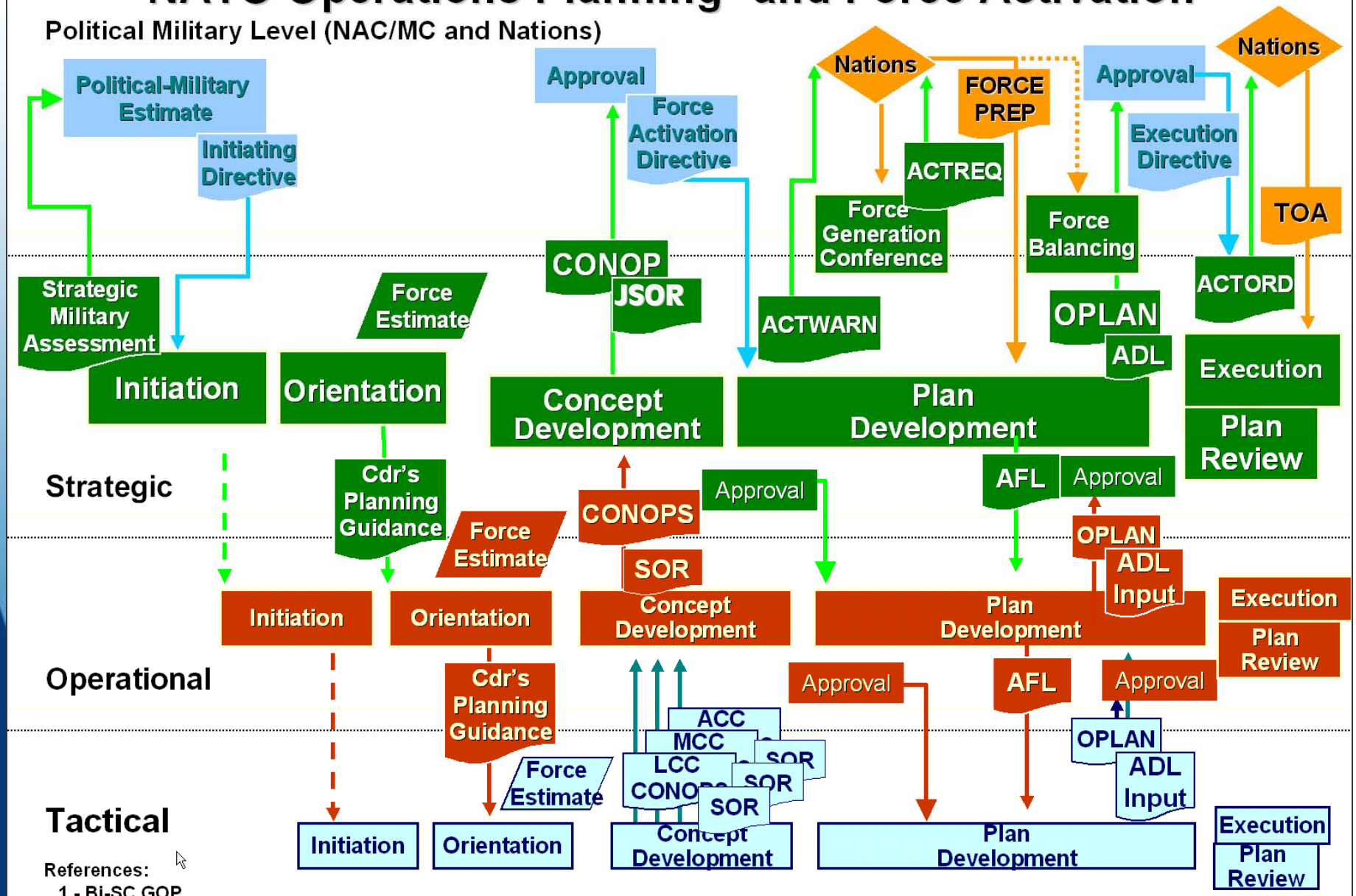



Orientation
Review Situation
Review (Higher Level)
Assumptions
Constraints/Restraints
Campaign plan
Decisive points
Objectives
End state
Transition Conditions
Tasks
Develop Own
Critical Facts and Assumptions
Constraints/Restraints
Key Strengths and Weaknesses (Own and Enemy)
Campaign planning
Tasks (Assigned/Implied)
Objectives
Transition conditions
Force Capabilities and Groupings Required
Command and Control Structures
Assess Risk
Propose Timelines
Battlespace Effects
Develop Mission Statement
Prepare Mission Analysis Brief
Develop/Issue Comd's Planning Guidance and Wng O
COA Dev.
Review CPG
Staff Analyse Factors
AOO Situation
Opposing Force Capabilities
Political Considerations
Own Force Capabilities
Time and Space
C2
Logistics and Movement
Rules of Engagement
Conflict Termination
Risk
Tasks (Assigned/Implied)
Lessons Learned
Develop Initial Enemy COAs
Develop Initial Own COAs
Present Information Brief
Comd Provides Further Guidance
COA Validation
COA Wargaming
Compare COAs
Deliver Decision Brief
Comd Selects COA
Write CONOPS
Plan Dev.
Seek CONOPS Approval from Higher Authority
Identify and Resolve Issues/Shortfalls
Prepare the Plan
Synchronize Annexes/SUPLANs
Develop Branches and Sequels if Required
Submit Plan for Approval
Revise Plan if Necessary
Issue Final Plan
Decision Support Tools
Risk Management
Risk elements
CCIR elements
End state
Transition Conditions
COG
COG Analysis
Objectives
Criteria Management
Decisive Point Analysis
Decision-matrix Management
COAs
Branches
Sequel
Plan
Plan Management
Plan
Plan
Critical Facts/ Assumptions
Constraints/ Restraints
Strengths/ Weaknesses
Assigned Task Implied Tasks
…
Dynamic Link Management

Links between elements of the CFOPP



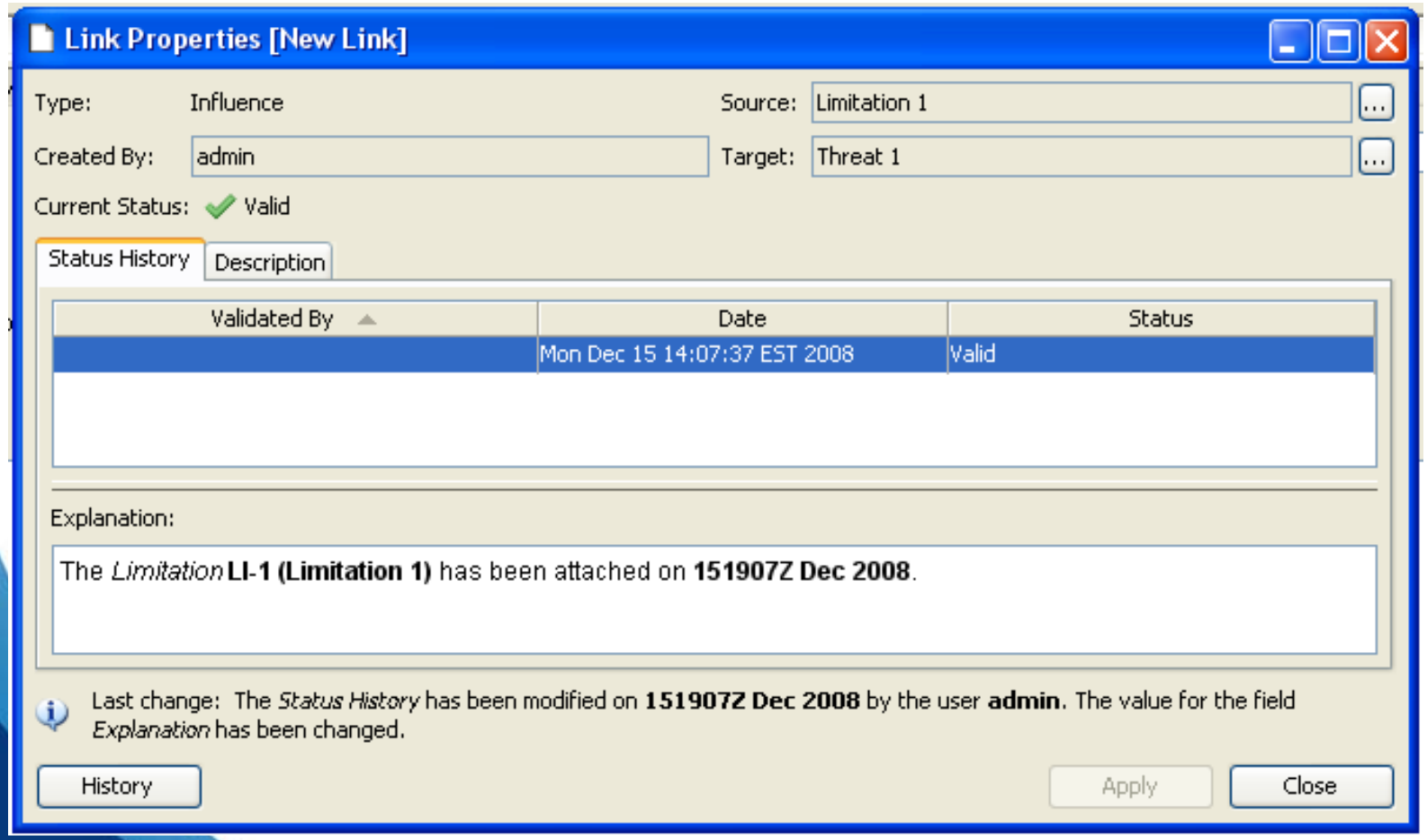
NATO Operations Planning[1] and Force Activation[2]

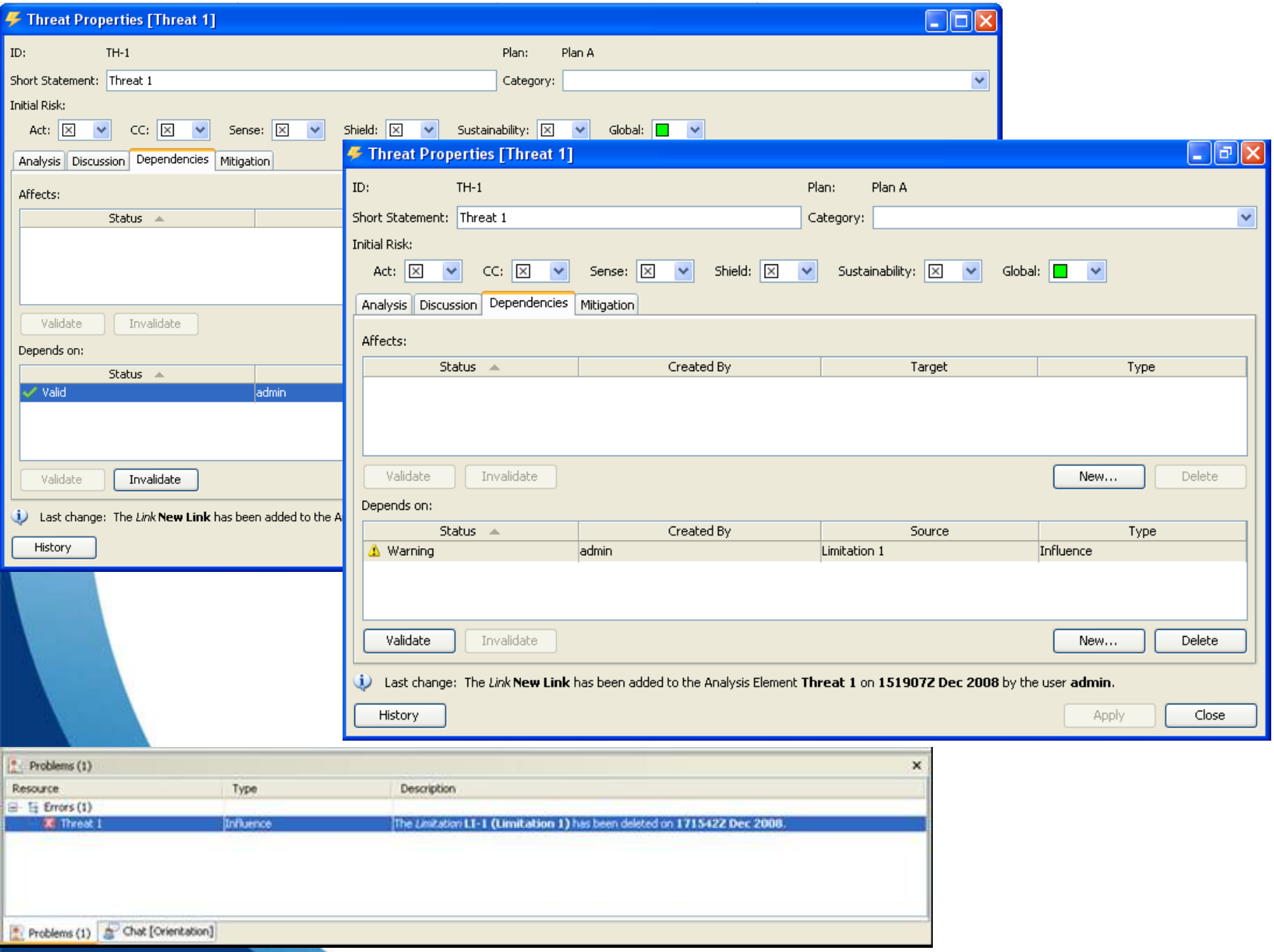


References:
1 - Bi-SC GOP
2 - MC 133/3

Dynamic Link Management

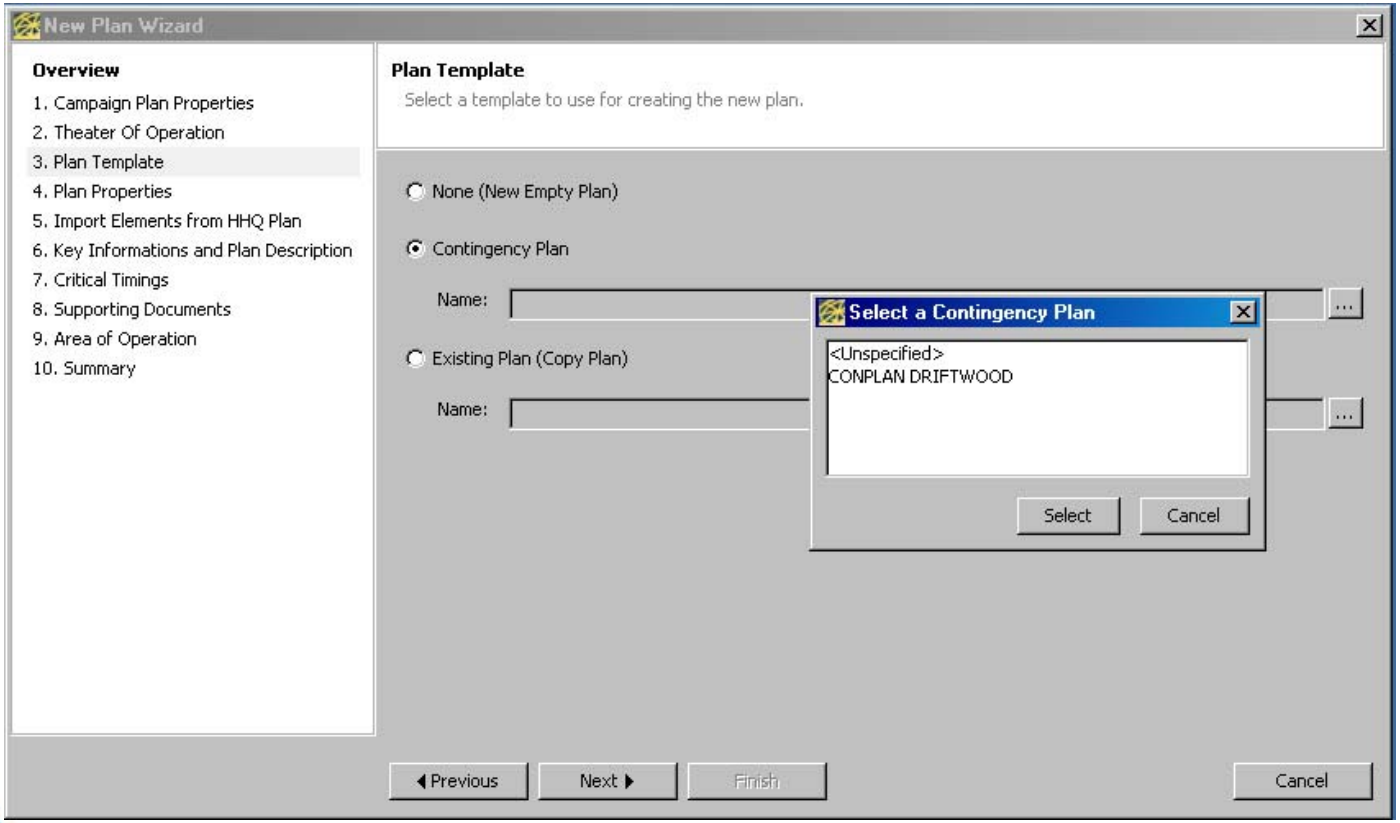
The CFOPP elements require a link enforcement concept to create integrity between elements.

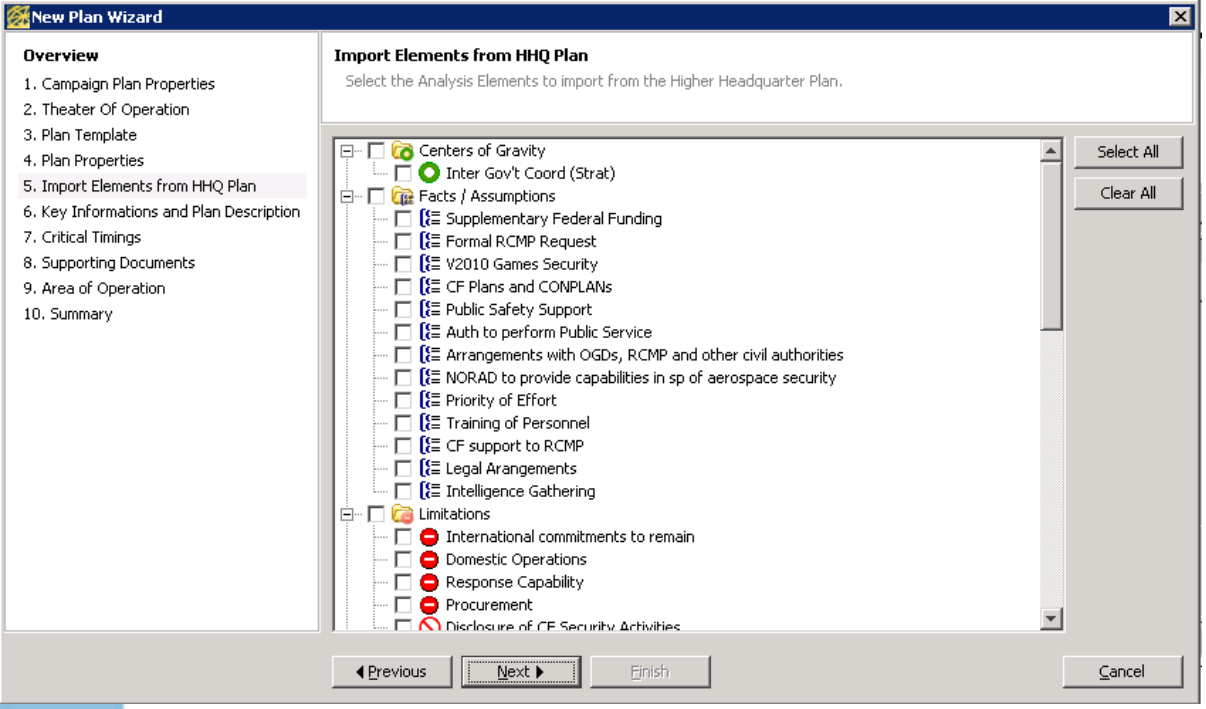


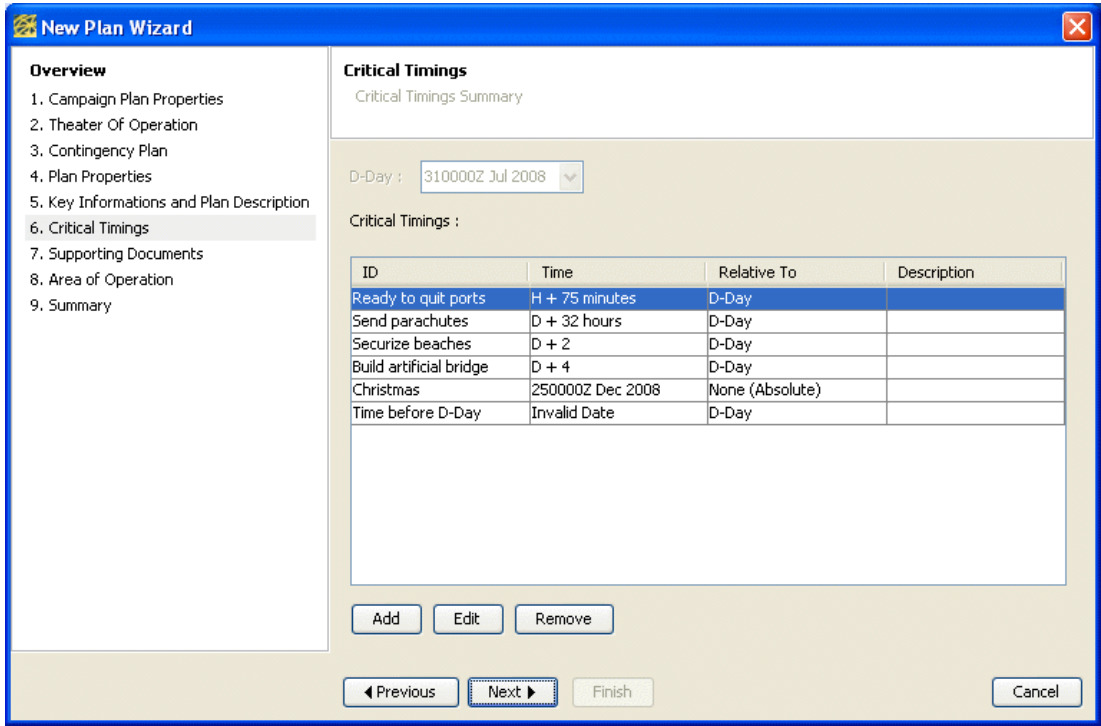

Threat Properties [Threat 1]
ID: TH-1
Plan: Plan A
Short Statement: Threat 1
Category:
Initial Risk:
Act: CC: Sense: Shield: Sustainability: Global:
Analysis Discussion Dependencies Mitigation
Affects:
Status
Validate Invalidate
Depends on:
Status
Valid admin
Validate Invalidate
Last change: The Link New Link has been added to the A
History
Threat Properties [Threat 1]
ID: TH-1
Plan: Plan A
Short Statement: Threat 1
Category:
Initial Risk:
Act: CC: Sense: Shield: Sustainability: Global:
Analysis Discussion Dependencies Mitigation
Affects:
Status Created By Target Type
Validate Invalidate New... Delete
Depends on:
Status Created By Source Type
Warning admin Limitation 1 Influence
Validate Invalidate New... Delete
Last change: The Link New Link has been added to the Analysis Element Threat 1 on 151907Z Dec 2008 by the user admin.
History
Apply Close
Problems (1)
Resource Type Description
Errors (1)
Threat 1 Influence The Limitation LI-1 (Limitation 1) has been deleted on 171542Z Dec 2008.
Problems (1) Chat [Orientation]

Plan Management

This is the capability to manage Operation Plan (OPLAN) and Contingency Plan (CONPLAN).

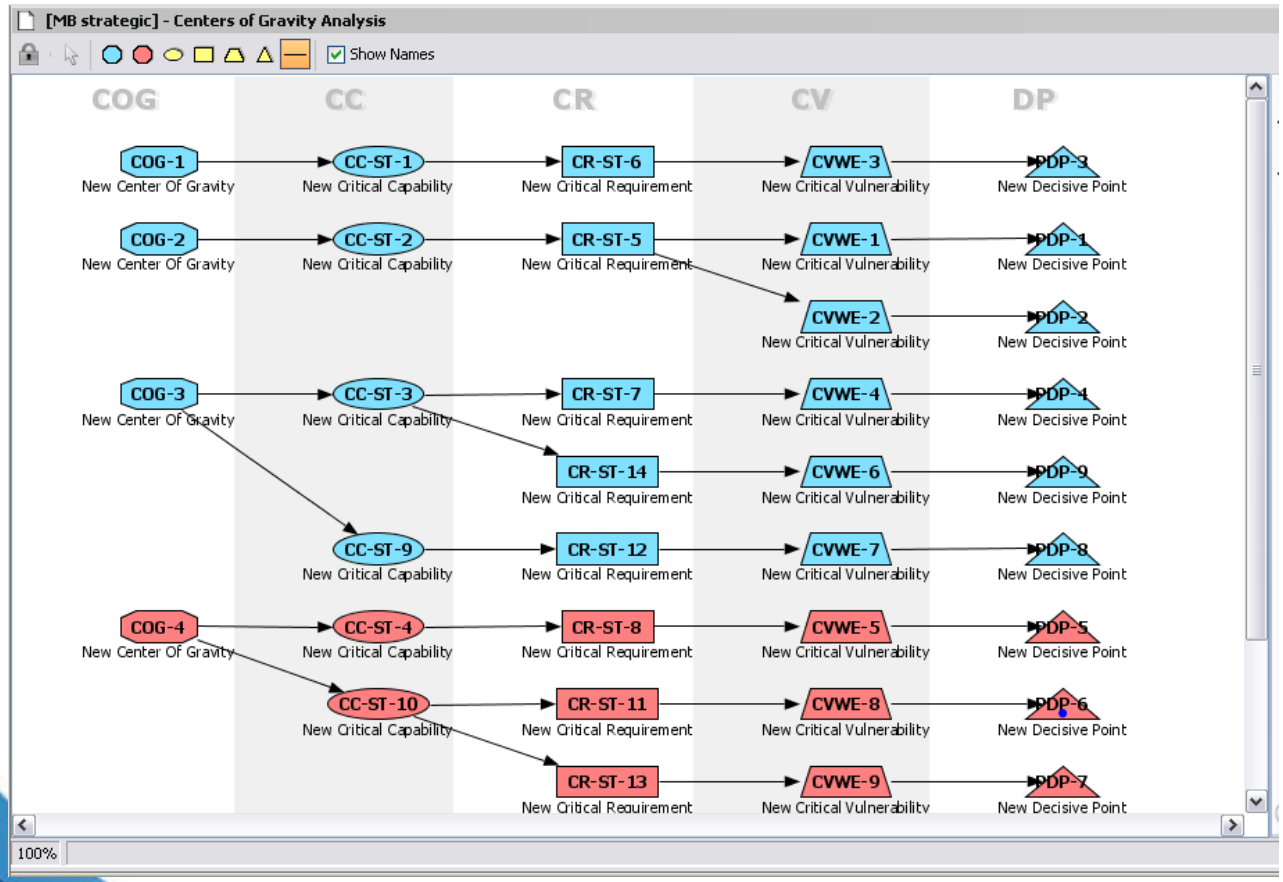


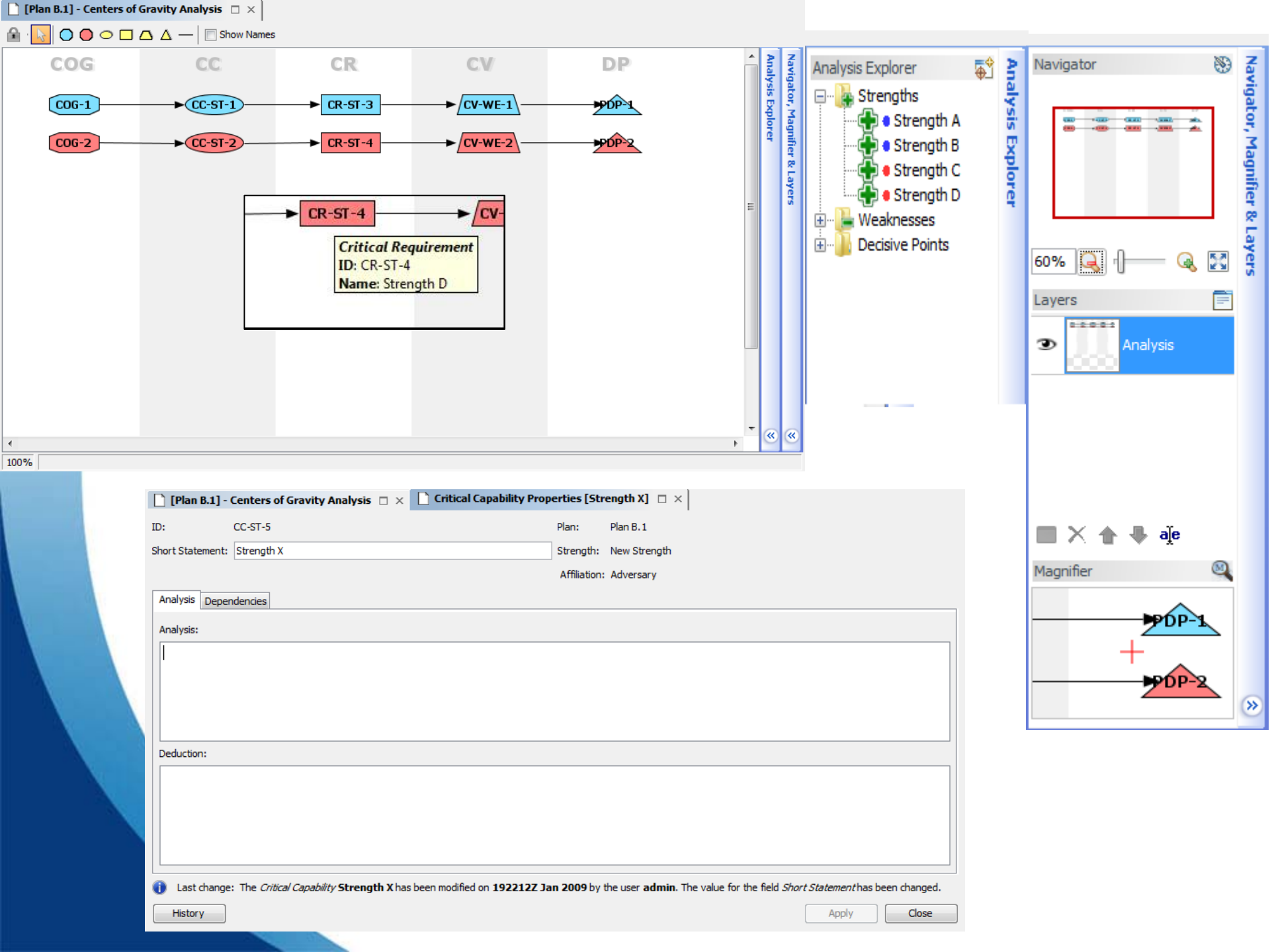

New Plan Wizard
Overview
1. Campaign Plan Properties
2. Theater Of Operation
3. Plan Template
4. Plan Properties
5. Import Elements from HHQ Plan
6. Key Informations and Plan Description
7. Critical Timings
8. Supporting Documents
9. Area of Operation
10. Summary
Import Elements from HHQ Plan
Select the Analysis Elements to import from the Higher Headquarter Plan.
Centers of Gravity
Inter Gov't Coord (Strat)
Facts / Assumptions
Supplementary Federal Funding
Formal RCMP Request
V2010 Games Security
CF Plans and CONPLANs
Public Safety Support
Auth to perform Public Service
Arrangements with OGDs, RCMP and other civil authorities
NORAD to provide capabilities in sp of aerospace security
Priority of Effort
Training of Personnel
CF support to RCMP
Legal Arangements
Intelligence Gathering
Limitations
International commitments to remain
Domestic Operations
Response Capability
Procurement
Select All
Clear All
Previous
Next
Finish
Cancel


New Plan Wizard
Overview
1. Campaign Plan Properties
2. Theater Of Operation
3. Contingency Plan
4. Plan Properties
5. Key Informations and Plan Description
6. Critical Timings
7. Supporting Documents
8. Area of Operation
9. Summary
Critical Timings
Critical Timings Summary
D-Day :
310000Z Jul 2008
Critical Timings :
ID
Time
Relative To
Description
Ready to quit ports
H + 75 minutes
D-Day
Send parachutes
D + 32 hours
D-Day
Securize beaches
D + 2
D-Day
Build artificial bridge
D + 4
D-Day
Christmas
250000Z Dec 2008
None (Absolute)
Time before D-Day
Invalid Date
D-Day
Add
Edit
Remove
Previous
Next
Finish
Cancel

Center of Gravity Analysis

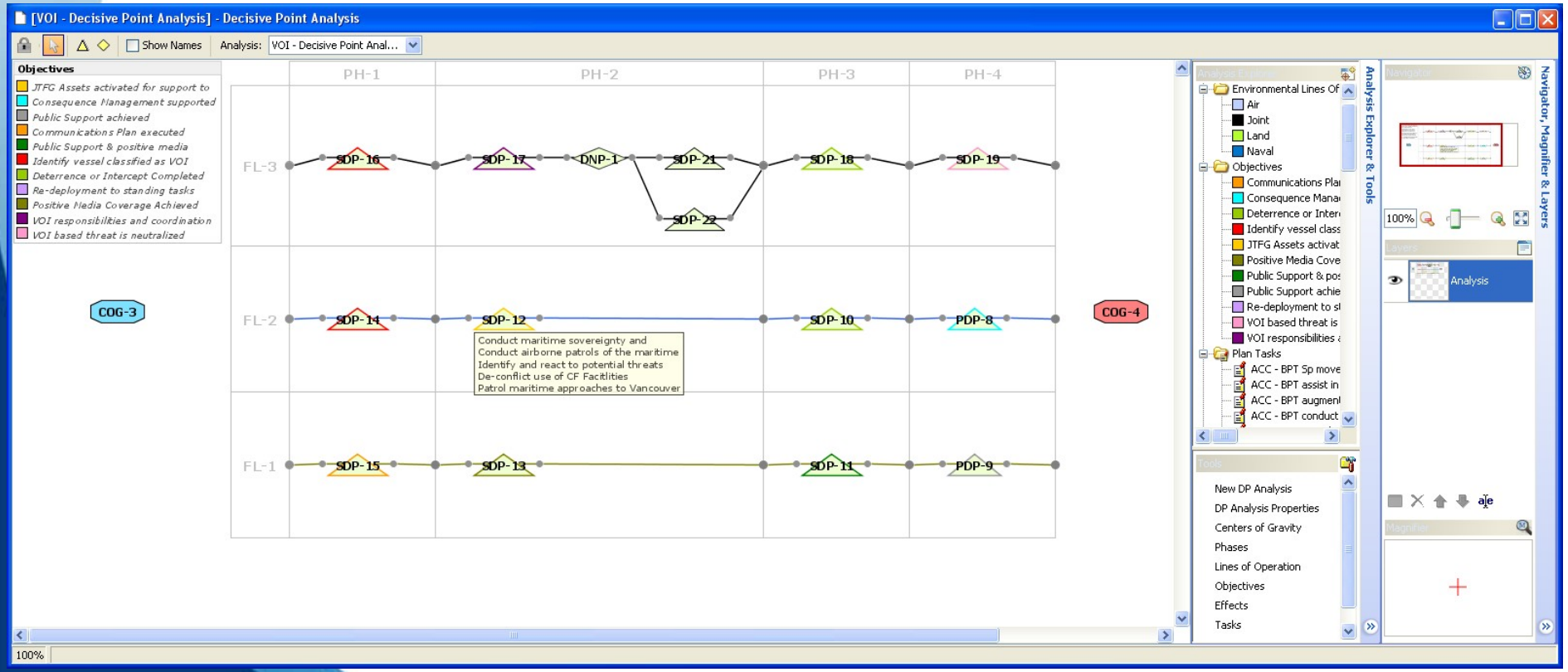
The Center of Gravity Analysis display is a tool, located in the Orientation stage, to create and visualize links between COGs, CCs, CRs, CVs and DPs.

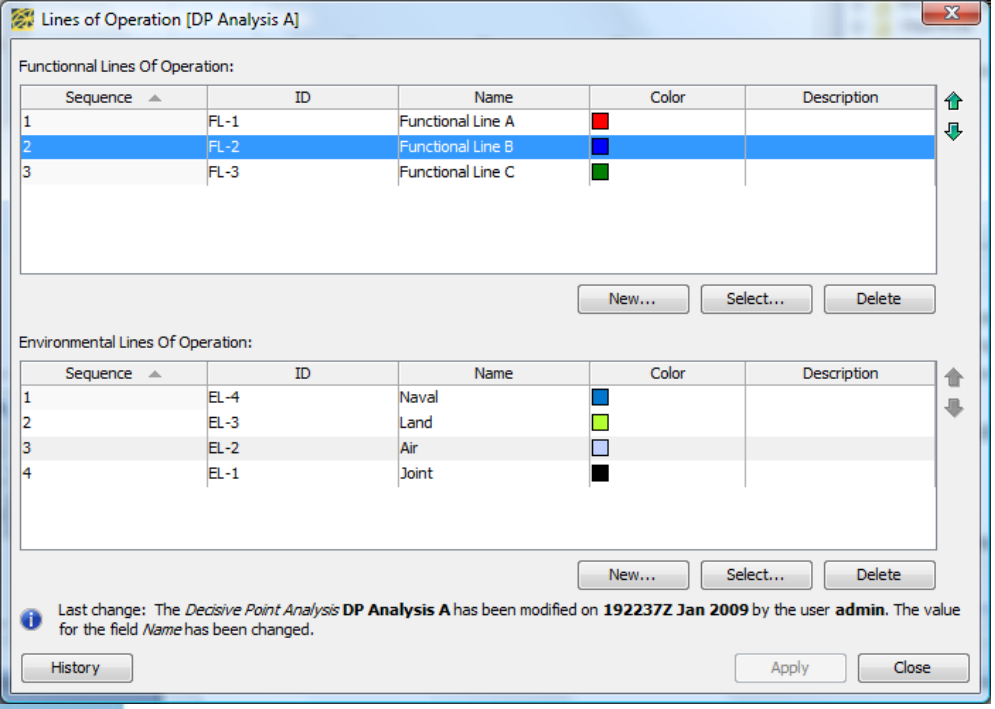


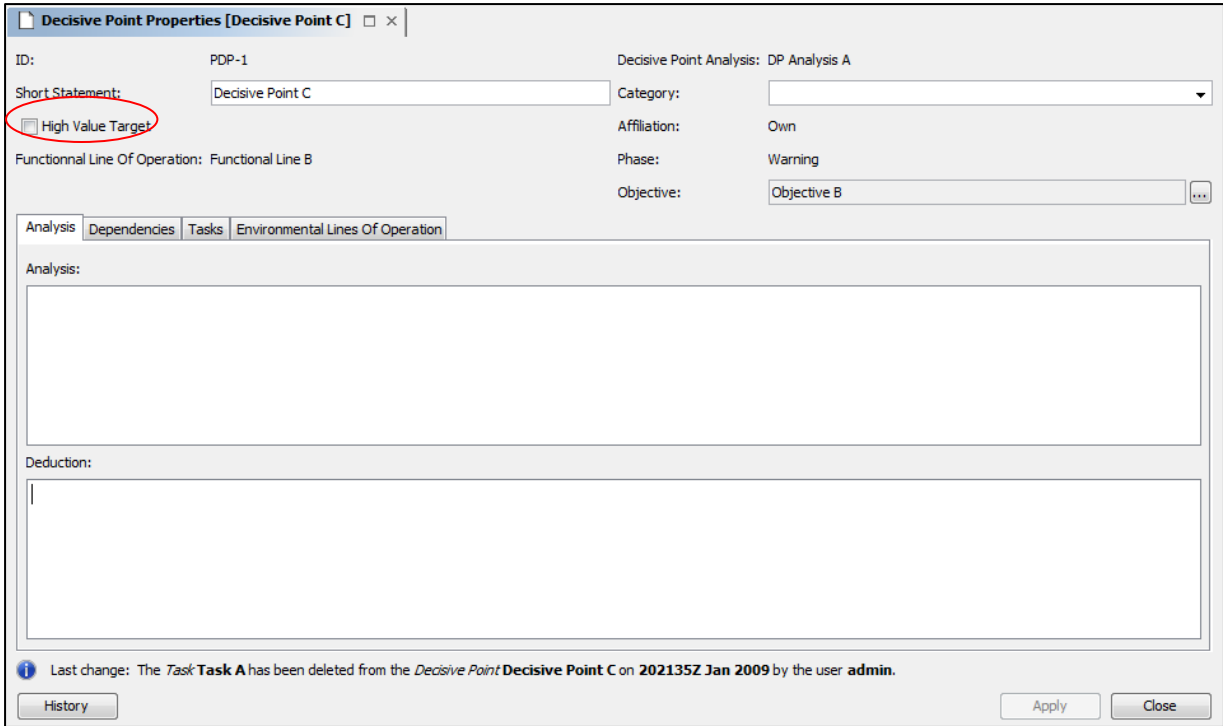

[Plan B.1] - Centers of Gravity Analysis
Show Names
COG
CC
CR
CV
DP
COG-1
COG-2
CC-ST-1
CC-ST-2
CR-ST-3
CR-ST-4
CV-WE-1
CV-WE-2
PDP-1
PDP-2
CR-ST-4
CV-
Critical Requirement
ID: CR-ST-4
Name: Strength D
100%
Analysis Explorer
Navigator, Magnifier & Layers
Analysis Explorer
Strengths
Strength A
Strength B
Strength C
Strength D
Weaknesses
Decisive Points
Navigator
60%
Layers
Analysis
Magnifier
PDP-1
PDP-2
Navigator, Magnifier & Layers
[Plan B.1] - Centers of Gravity Analysis
Critical Capability Properties [Strength X]
ID: CC-ST-5
Plan: Plan B.1
Short Statement: Strength X
Strength: New Strength
Affiliation: Adversary
Analysis
Dependencies
Analysis:
Deduction:
Last change: The Critical Capability Strength X has been modified on 192212Z Jan 2009 by the user admin. The value for the field Short Statement has been changed.
History
Apply
Close

Decisive Point Analysis

The Decisive Point Analysis allows the planner to graphically manage the sequencing of DPs, their relations, influences and line of operations.

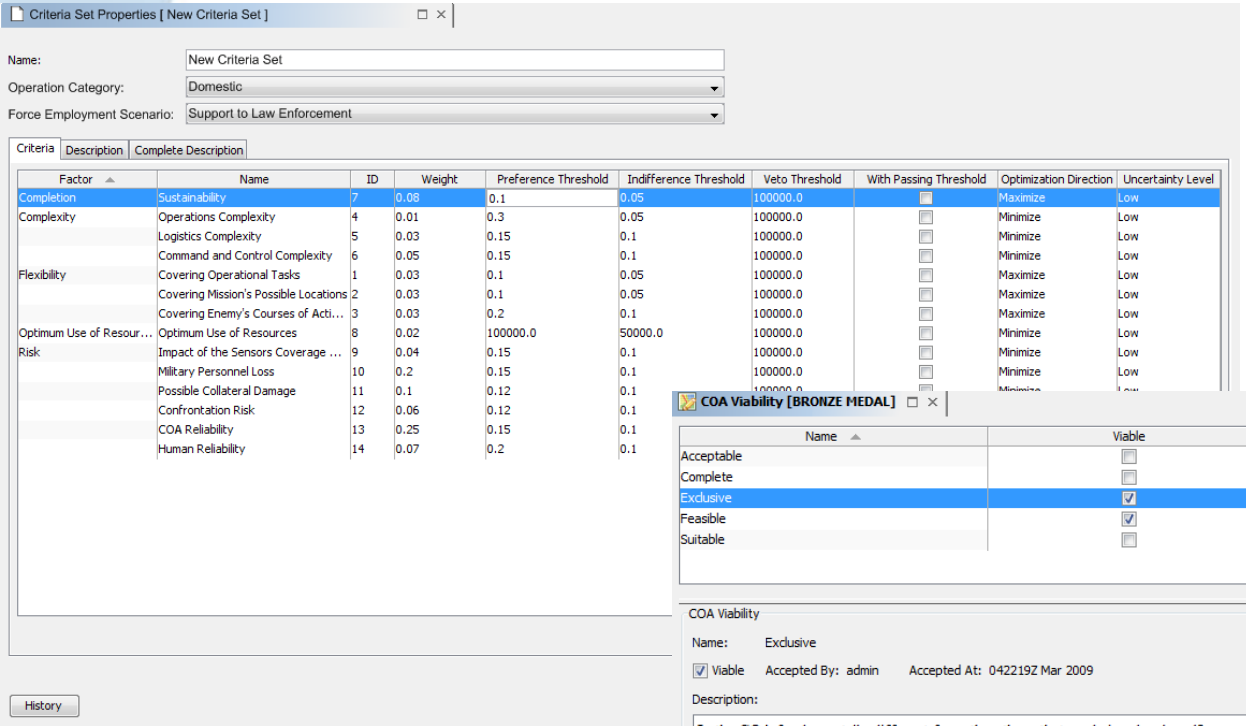


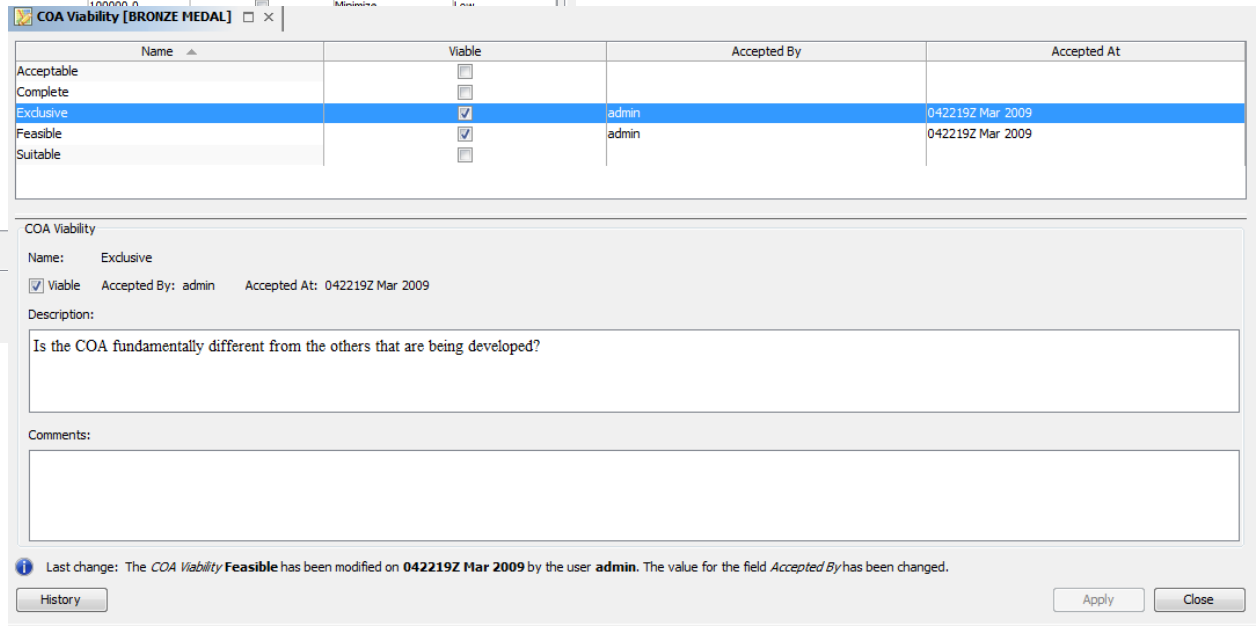

Lines of Operation [DP Analysis A]
Functionnal Lines Of Operation:
Sequence
ID
Name
Color
Description
1
FL-1
Functional Line A
2
FL-2
Functional Line B
3
FL-3
Functional Line C
New...
Select...
Delete
Environmental Lines Of Operation:
Sequence
ID
Name
Color
Description
1
EL-4
Naval
2
EL-3
Land
3
EL-2
Air
4
EL-1
Joint
New...
Select...
Delete
Last change: The Decisive Point Analysis DP Analysis A has been modified on 192237Z Jan 2009 by the user admin. The value for the field Name has been changed.
History
Apply
Close

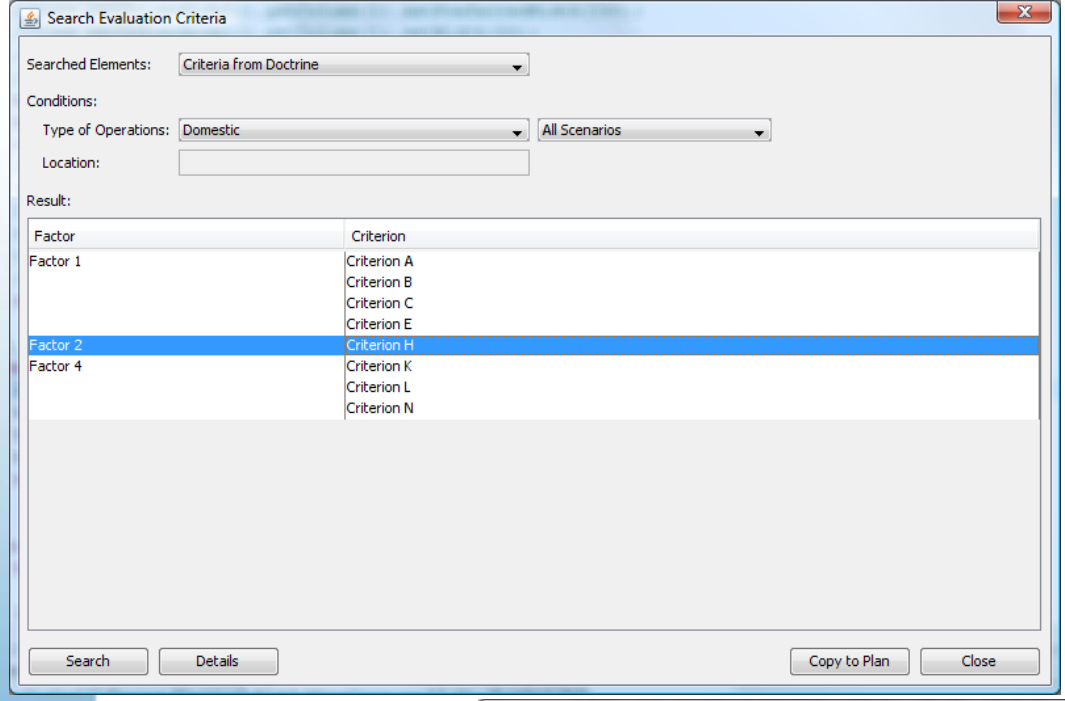

Decisive Point Properties [Decisive Point C]
ID:
PDP-1
Decisive Point Analysis:
DP Analysis A
Short Statement:
Decisive Point C
Category:
High Value Target
Affiliation:
Own
Functionnal Line Of Operation:
Functional Line B
Phase:
Warning
Objective:
Objective B
Analysis
Dependencies
Tasks
Environmental Lines Of Operation
Analysis:
Deduction:
Last change: The Task Task A has been deleted from the Decisive Point Decisive Point C on 202135Z Jan 2009 by the user admin.
History
Apply
Close

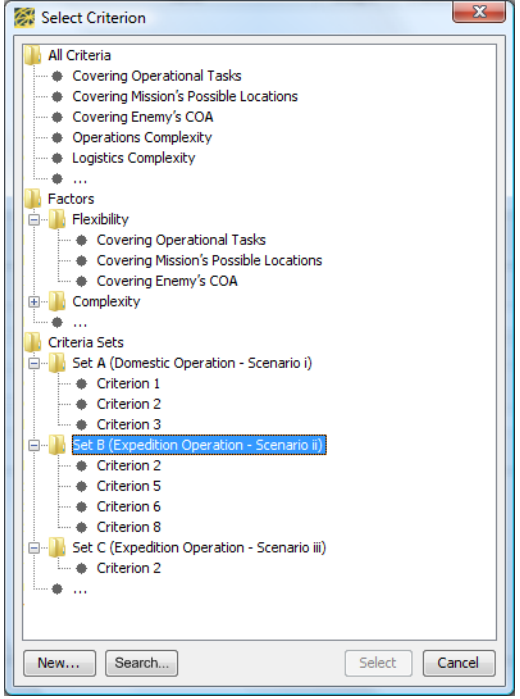
Criteria Management

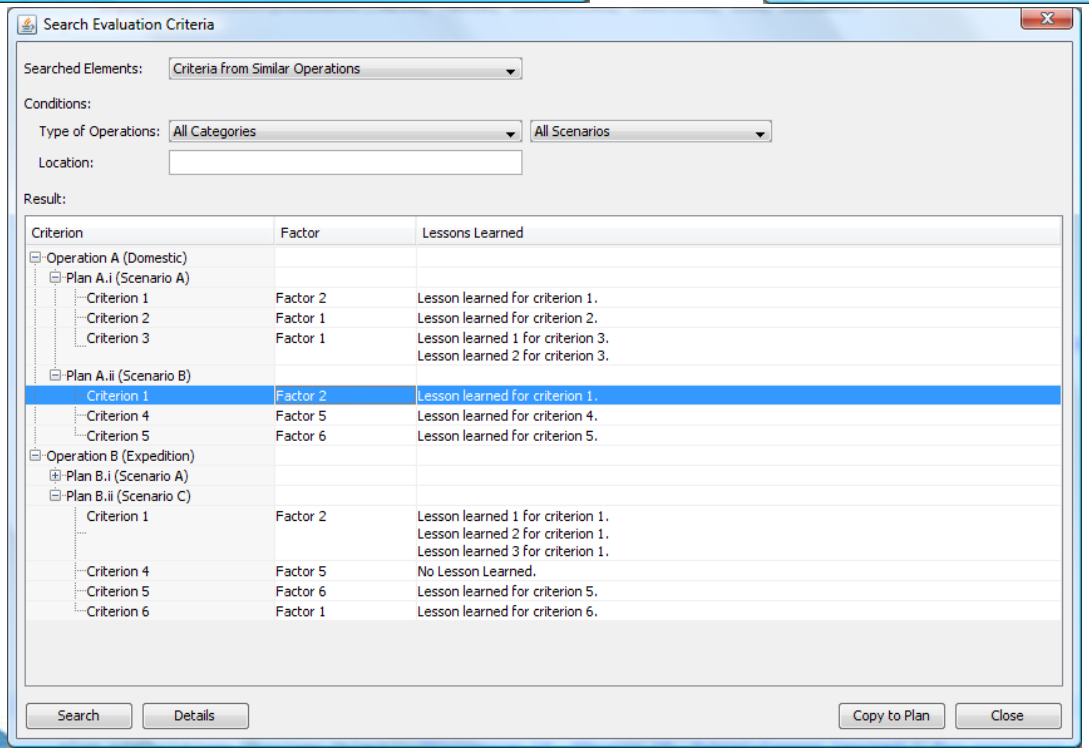
This computer-based tool provides management functions for different types of criteria related to the CFOPP.





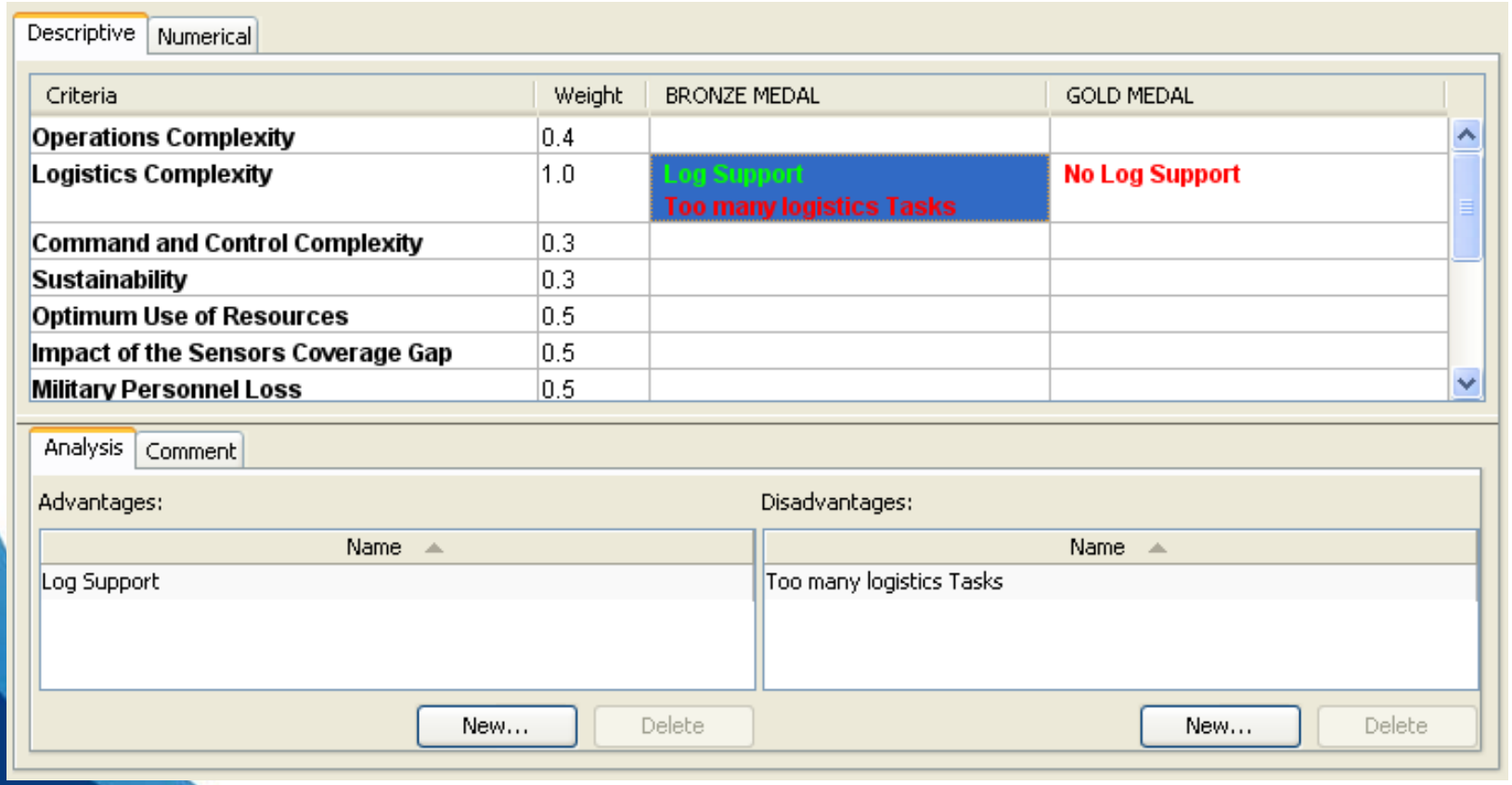

Search Evaluation Criteria
Searched Elements:
Criteria from Doctrine
Conditions:
Type of Operations:
Domestic
All Scenarios
Location:
Result:
Factor
Criterion
Factor 1
Criterion A
Criterion B
Criterion C
Criterion E
Factor 2
Criterion H
Factor 4
Criterion K
Criterion L
Criterion N
Search
Details
Copy to Plan
Close


Select Criterion
All Criteria
Covering Operational Tasks
Covering Mission's Possible Locations
Covering Enemy's COA
Operations Complexity
Logistics Complexity
...
Factors
Flexibility
Covering Operational Tasks
Covering Mission's Possible Locations
Covering Enemy's COA
Complexity
...
Criteria Sets
Set A (Domestic Operation - Scenario i)
Criterion 1
Criterion 2
Criterion 3
Set B (Expedition Operation - Scenario ii)
Criterion 2
Criterion 5
Criterion 6
Criterion 8
Set C (Expedition Operation - Scenario iii)
Criterion 2
...
New...
Search...
Select
Cancel


Search Evaluation Criteria
Searched Elements:
Criteria from Similar Operations
Conditions:
Type of Operations:
All Categories
All Scenarios
Location:
Result:
Criterion
Factor
Lessons Learned
Operation A (Domestic)
Plan A.i (Scenario A)
Criterion 1
Factor 2
Lesson learned for criterion 1.
Criterion 2
Factor 1
Lesson learned for criterion 2.
Criterion 3
Factor 1
Lesson learned 1 for criterion 3.
Lesson learned 2 for criterion 3.
Plan A.ii (Scenario B)
Criterion 1
Factor 2
Lesson learned for criterion 1.
Criterion 4
Factor 5
Lesson learned for criterion 4.
Criterion 5
Factor 6
Lesson learned for criterion 5.
Operation B (Expedition)
Plan B.i (Scenario A)
Plan B.ii (Scenario C)
Criterion 1
Factor 2
Lesson learned 1 for criterion 1.
Lesson learned 2 for criterion 1.
Lesson learned 3 for criterion 1.
Criterion 4
Factor 5
No Lesson Learned.
Criterion 5
Factor 6
Lesson learned for criterion 5.
Criterion 6
Factor 1
Lesson learned for criterion 6.
Search
Details
Copy to Plan
Close

Decision-Matrix Management

This computer-based tool supports decision-matrixes with the flexibility to use numerical as well as descriptive analytical approaches.



Descriptive | Numerical

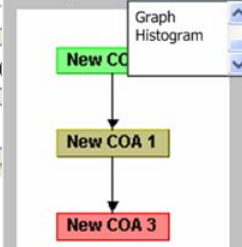
Criteria	Weight	Optimization Direction	BRONZE MEDAL	GOLD MEDAL
Operations Complexity	0.4	Maximize	Very High	Missing Evaluation
Logistics Complexity	1.0	Maximize	Very High	Missing Evaluation
Command and Control Complexity	0.3	Maximize	Very High	Very Low
Sustainability	0.3	Maximize	2	Missing Evaluation
Optimum Use of Resources	0.5	Maximize	2	Missing Evaluation
Impact of the Sensors Coverage Gap	0.5	Maximize	Medium	Low
Military Personnel Loss	0.5	Maximize	Medium	Missing Evaluation
Collateral Damage	0.5	Maximize	Extremely High	Missing Evaluation
Confrontation Risk	0.5	Maximize	Very Low	Missing Evaluation
COA Reliability	0.5	Maximize	2	1
Human Reliability	0.3	Maximize	Very Low	Missing Evaluation
Covering Enemy's Courses of Actions	0.5	Maximize	2	Missing Evaluation
Covering Mission's Possible Locations	1.0	Maximize	Missing Evaluation	Missing Evaluation
Covering Operational T				ing Evaluation

Relevance: Missing But N

Evaluation:

Ranking View: Graph

Graph
Histogram



Recommendation:

New COA 2

Justification:

Robustness

0% Interval

+/- 10% Interval

Evaluation: Robust Compute

Explanations

Why COA New COA 2 is ranked first ?

Why COA New COA 3 is ranked last ?

Why COA New COA 2 is better than New COA 1 ?

Why New COA 2 is ranked first?

	Cost	Flexibility	Risk
New COA 1	5.0	5.0	3.0
New COA 2	1.0	2.0	4.0
New COA 3	3.0	3.0	3.0

Therefore, there is 1 evidences that New COA 2 is at least as good as other actions.
Criterions that shown these evidences are the following:

- Risk (Weight 0.37250000000000005)

There is 2 evidences that other actions are better than New COA 2.
Criterions that shown these evidences are the following:

- Cost (Weight 0.2589999999999999)
- Flexibility (Weight 0.3685)

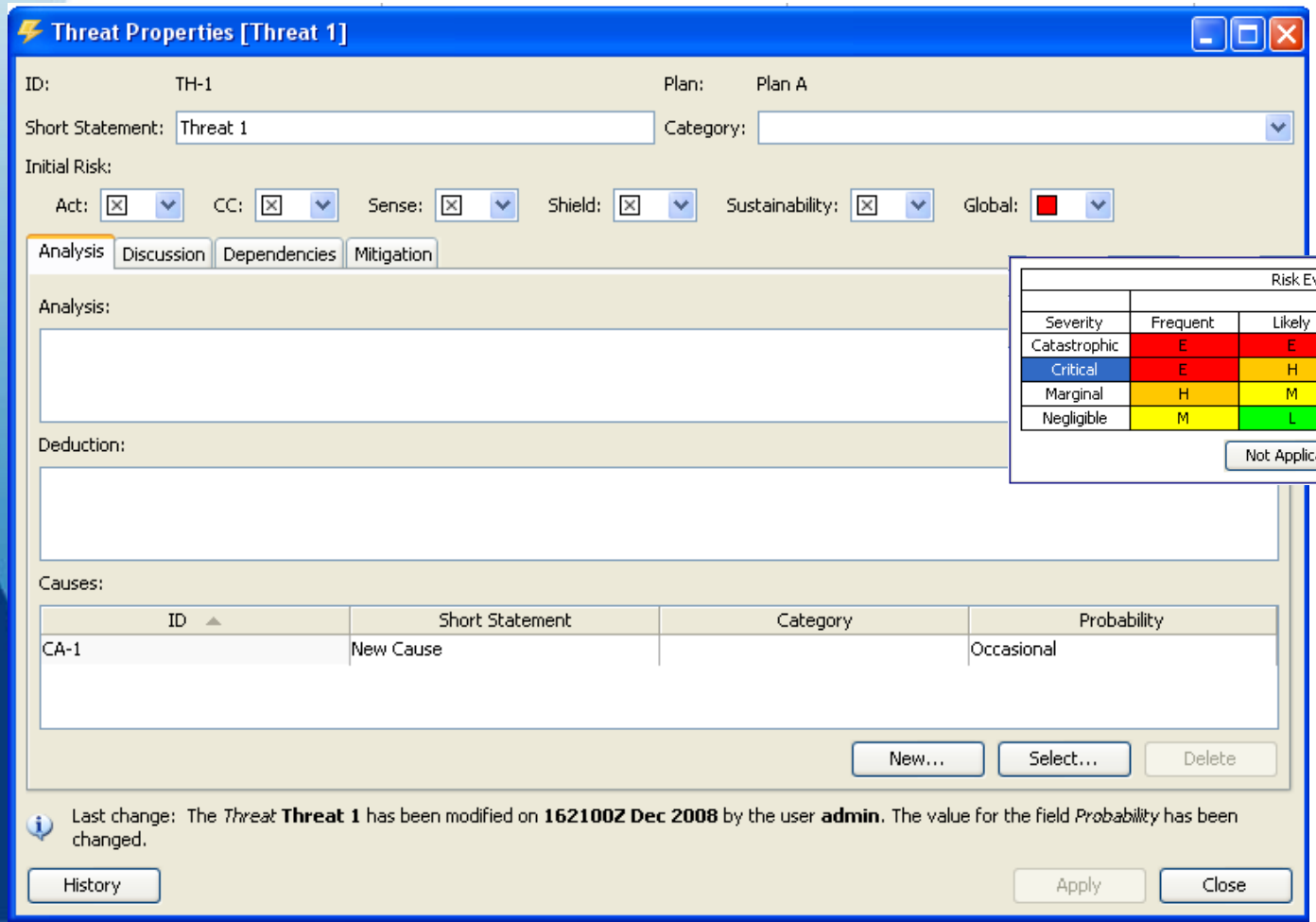
Why New COA 2 is better than New COA 1?

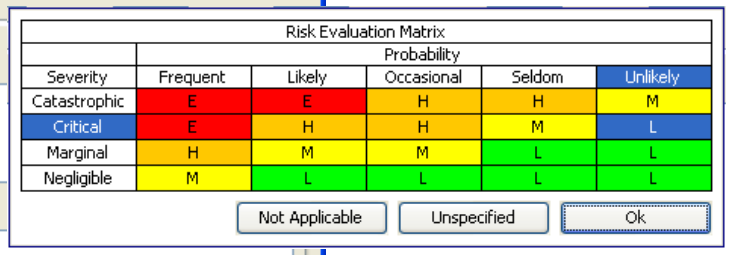
New COA 2 is better than New COA 1 because of the veto threshold of criterions Risk.

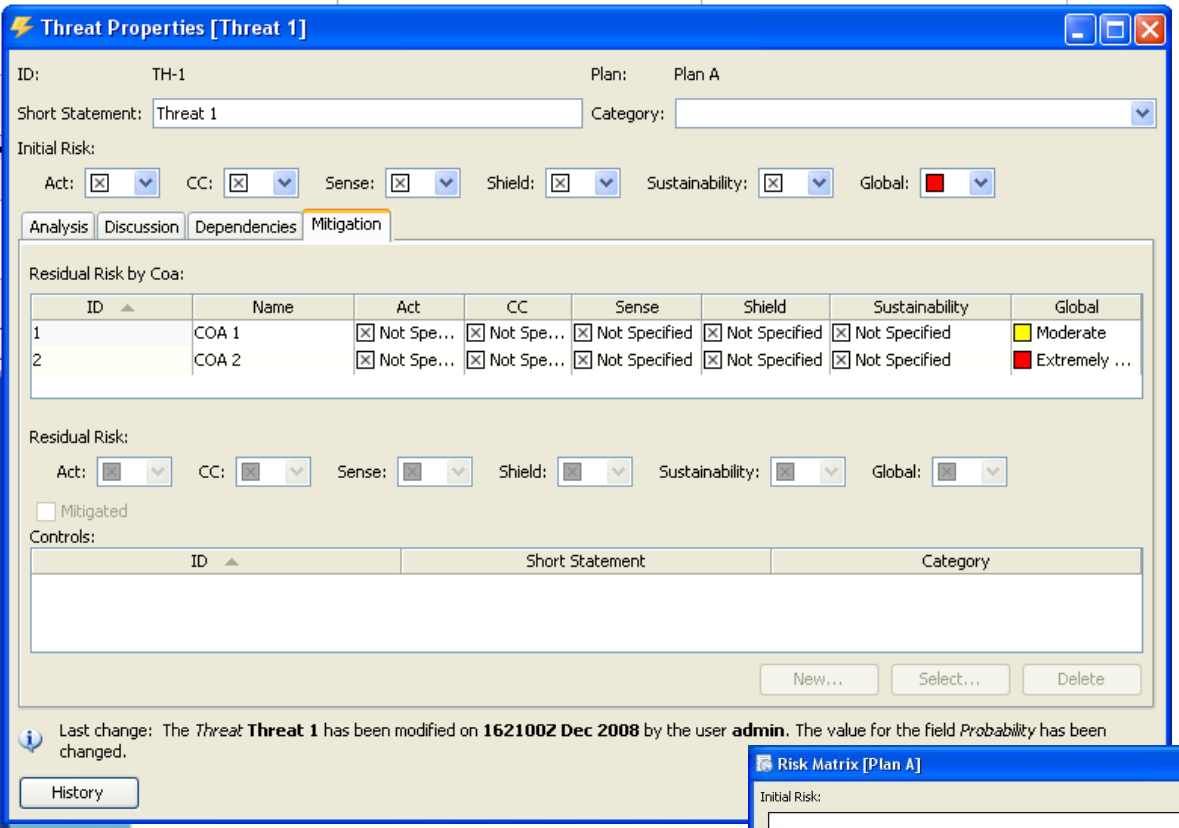
Why New COA 2 is better than New COA 3?

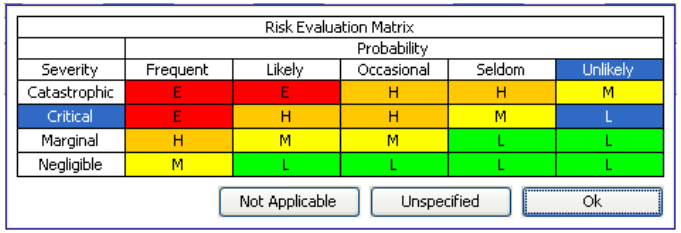
Risk Management

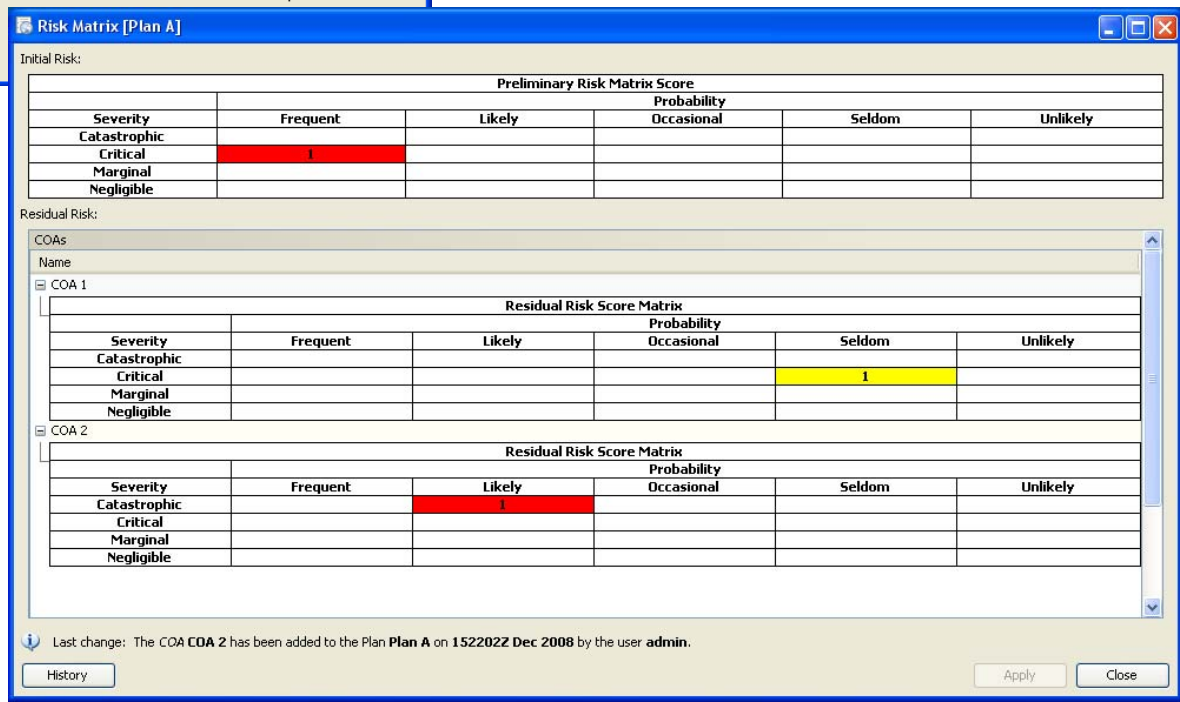
The purpose of risk management for CF operations is to effectively identify, analyze, evaluate and control all types of risk.






Threat Properties [Threat 1]
ID: TH-1
Plan: Plan A
Short Statement: Threat 1
Category:
Initial Risk:
Act: CC: Sense: Shield: Sustainability: Global:
Analysis Discussion Dependencies Mitigation
Residual Risk by Coa:
ID Name Act CC Sense Shield Sustainability Global
1 COA 1 Not Spe... Not Spe... Not Specified Not Specified Not Specified Moderate
2 COA 2 Not Spe... Not Spe... Not Specified Not Specified Not Specified Extremely ...
Residual Risk:
Act: CC: Sense: Shield: Sustainability: Global:
Mitigated
Controls:
ID Short Statement Category
New... Select... Delete
Last change: The Threat Threat 1 has been modified on 162100Z Dec 2008 by the user admin. The value for the field Probability has been changed.
History


Risk Evaluation Matrix
Probability
Severity Frequent Likely Occasional Seldom Unlikely
Catastrophic E E H H M
Critical E H H M L
Marginal H M M L L
Negligible M L L L L
Not Applicable
Unspecified
Ok


Risk Matrix [Plan A]
Initial Risk:
Preliminary Risk Matrix Score
Probability
Severity Frequent Likely Occasional Seldom Unlikely
Catastrophic
Critical 1
Marginal
Negligible
Residual Risk:
COAs
Name
COA 1
Residual Risk Score Matrix
Probability
Severity Frequent Likely Occasional Seldom Unlikely
Catastrophic
Critical 1
Marginal
Negligible
COA 2
Residual Risk Score Matrix
Probability
Severity Frequent Likely Occasional Seldom Unlikely
Catastrophic 1
Critical
Marginal
Negligible
Last change: The COA COA 2 has been added to the Plan Plan A on 152202Z Dec 2008 by the user admin.
History
Apply
Close

Conclusion

- 7 tools have been implemented into COPlanS
- Basic Mechanisms are now there to implement more advance concepts for each one of these tools.
- Better visualisation approaches need to be developed

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