



# Co-OPR – Compendium and I-X



**AIAI, University of Edinburgh, UK**

**Knowledge Media Institute, Open University, UK**

**IHMC, Pensacola, FL, USA**

<http://www.aiai.ed.ac.uk/project/co-opr/>

- ***Compendium*** - Collaborative sensemaking and group memory to integrate COA & DIME analyses
- ***I-X*** - Intelligent collaborative command, planning and execution support
- ***<I-N-C-A>*** - Underlying model for sharing of issues, activity nodes, constraints and annotations

# Co-OPR – Expt B Results Summary



- Compendium aided the Plans Director by integrating both the informal factors of COA and DIME analysis, in the process generating a structured group memory [as anticipated]
- I-X proved useful in aiding the Military Planner to identify and refine operational approaches, and propose these to the group [as anticipated]
- Compendium and I-X were both able to be adapted dynamically to the Planning Cell's preferences for changes of approach and terminology
- Advanced knowledge and AI planning technologies were effectively hidden behind the scenes in order to preserve a simple visual interface for the planning team [as anticipated]
- Tools allowed effective use of “**grey matter**” and **silicon** during the experiment.

# Co-OPR - Compendium

**Compendium - Co-OPR Expt. B 2004.11.16**

File Edit Map Format Tools Favorites Workspaces Window Help

100% 1:1

[Map]: C... [Map]: COA-2.1: Coalition D.I.m.E. (US; UK; AU)

**Left Panel:**

- JPRC 16 94
- Map: JTFC 1 23
- Situation Analysis 8 47
- Assumptions 31 22
- Constraints/Restrictions 49 22
- Risk Assessment 37 22
- Specified Tasks 30 22
- Implied Tasks 32 22
- Essential Tasks 27 22
- Restated Mission 26 22
- Cmdr's Intent 24 20

**Top Panel:**

- JPRC 16 94
- MAP: COA-3 1 2
- COA Comparison 28 12
- PMESII effects? 5 11
- IP capacity? 5 12
- RM R. Superiority? 7 12
- 1. Safe return of hostages 13
- Do not destabilize region 11
- Ensure safe retrieval of hostages 10
- Reinforce rule of law 11
- Be prepared for coalition follow-on 11
- Preserve regional stability 11
- Maintain good relations with nations 11
- Do not disturb CA balance of power or govt structure 12
- No hostage can be harmed 12

**Grid:**

- Rescue Mech. 6
- General issues 2
- Support 6
- IP 13
- Need to focus on Cebesoy 11
- Analysis of approaching Cebesoy 11
- Focus on President Melen 11
- Contact senior military command structure to exert pressure via State 11

**[Map]: Analysis of approaching Cebesoy**

**Central Question:** Should we approach Cebesoy to bypass the president to defuse the situation?

**Arguments:**

- Positive (+):**
  - Cebesoy has contacts with several ambassadors
  - Admiral: We can contact Cebasoy and offer him help in moving the troops...
  - Tell Cebesoy that we know what he's doing
- Negative (-):**
  - CA has rejected all diplomatic approaches and offers of assistance
  - Cebesoy is not a stable person -- approaching president could be...
- Unknown (?):**
  - Calif govt lacks lift to move troops: Can we offer CA C130s or large trucks?
  - Can we offer economic inducements?
  - Do we go public about what we know about the conspiracy?

# Co-OPR - I-X

## Process Panel

### Domain Editor

Assisting Military Planner with operational approach to use a single SOP ODA to land at Four Springs.

JPRC at 22-Nov-04 12:09:52:  
Assisting Military Planner with operational approach to use a single SOP ODA to land at Four Springs.

Assisting Military Planner with operational approach to use a single SOP ODA to land at Four Springs.

Issue  Highest Priority  Report Back - Ref =   
 Activity  High Priority  Report Type =   
 Constraint  Normal Priority  Recipient =   
 Report  Low Priority   
 Message  Lowest Priority

Send

Description	Annotations	Priority	Action
what can we get from initial briefing?	Mission Analysis:	Normal	No Action
consider adding verify-location task afterwards		Normal	No Action
consider adding protect activities afterwards		Normal	No Action
consider adding provide activities afterwards		Normal	No Action
consider adding diversion activities afterwards		Normal	No Action

Description	Annotations	Priority	Action
report UNESCO-Visitors		Normal	No Action
locate UNESCO-Visitors		Low	No Action
allocate-one sof-oda SF-ODA-1 (...)		Normal	Done
move-from-base SF-ODA-1 UNESCO-Visitors		Normal	NA
move-by-fixed-wing SF-ODA-1 (...)		Normal	Delegate to I-Plan
halo-drop SF-ODA-1		Normal	Expand using locate-already-known
verify-location UNESCO-Visitors		Normal	Expand using locate-by-asking
locate UNESCO-Visitors		Normal	Expand using locate-air-search
support SF-ODA-1 UNESCO-Visitors		High	Expand using locate-ground-search
allocate-one sof-oda SF-ODA-2 (...)		Normal	Expand using locate-air-and-ground-search
move-from-base SF-ODA-2 UNESCO-Visitors		Normal	Expand using locate-using-satellite-intelligence
move-by-heli SF-ODA-2 LZ-N...		Normal	Expand using locate-using-human-intelligence
recover SF-ODA-2 UNESCO-Visitors		Highest	Send to Compendium as a node
extract-by-helicopter SF-ODA-2...		Normal	Expanded by extract-by-heli
protect SF-ODA-2 UNESCO-Visitors		Normal	No Action
make-contact SF-ODA-2 UNESCO-Visitors		Normal	No Action
authenticate SF-ODA-2 UNESCO-Visitors		Normal	No Action

State	Pattern	Value
loc.infantry.oda-6	mission-time	

Annotations	Key	Value

### Map Tool

### Messenger

### I-Plan

JPRC I-X I-Plan Tool

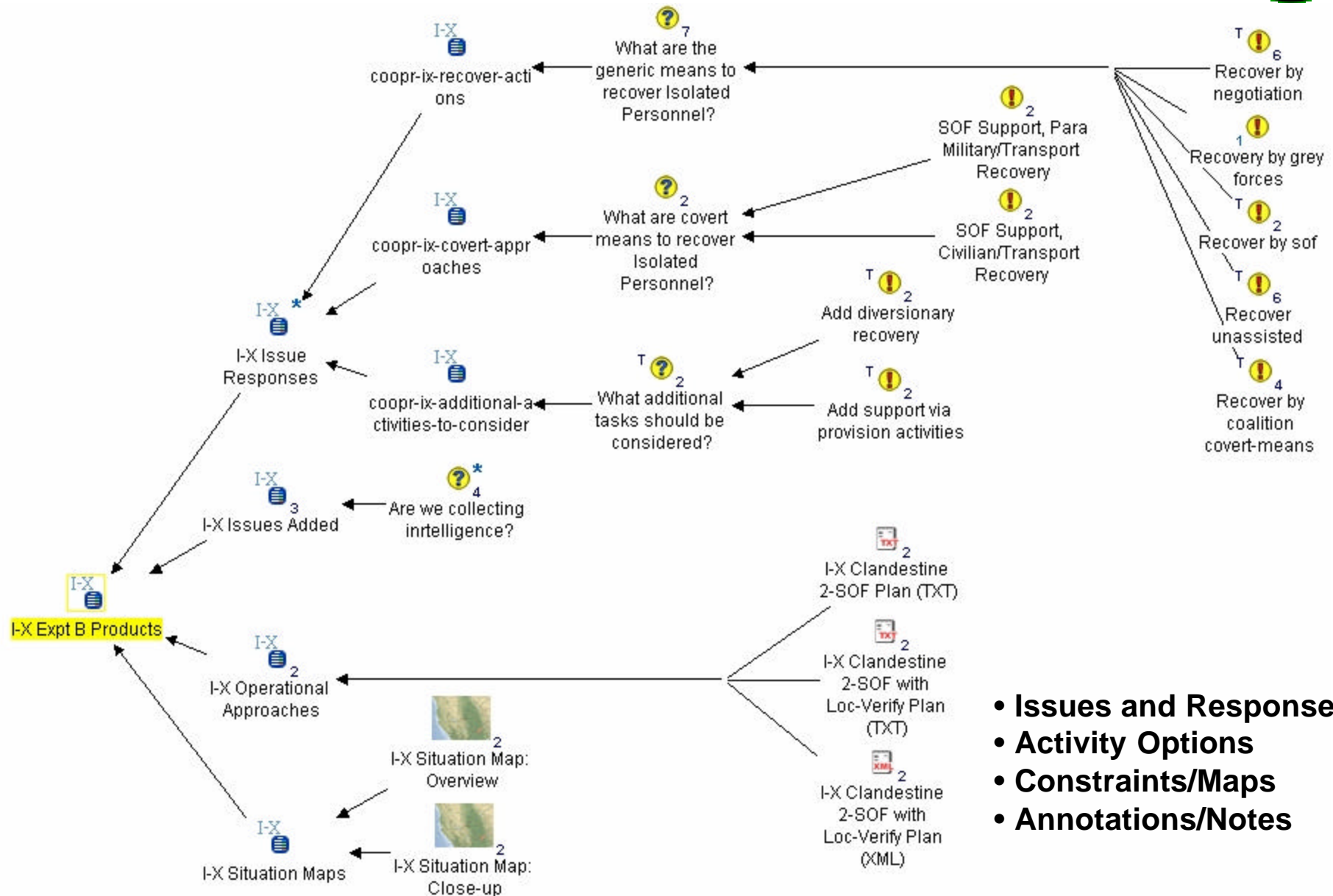
SOF-Entry-Via-Four-Springs-2.2.2

Planning statistics:  
 Steps taken = 25  
 Alternatives posted = 24  
 Alternatives picked = 5  
 Alternatives remaining = 25  
 Number of nodes = 7  
 Longest node-end path length = 11

Plan Replan Check Plan

# Grey Matter and Silicon

## I-X Inputs to Compendium during Expt B



- Issues and Responses
- Activity Options
- Constraints/Maps
- Annotations/Notes



# Co-OPR - Illustrating a More Collaborative Planning Framework



- ***Linked collaborative planning and plan analysis aids*** share tasks, standard operating procedures, policies and current situation information
- ***Links*** between informal human-oriented outline planning and more structured semi-automated detailed planning
- ***Outer level:*** human relatable and presentable objective statements, sensemaking, advice, multiple options, argumentation and outline plans
- ***Inner level:*** detailed planners, search engines, constraint solvers, analyzers and simulators act in an understandable and controllable way to provide feasibility checks, detailed constraints and guidance
- ***Sharing*** of issues, activity options, constraints and annotations between humans and systems operating at various levels
- ***Context*** and current environment sensitivity