APPENDIX A

THREAT SCENARIOS

SUMMARY

The initial step in the Combat System selection process is to estimate the future threat scenarios so the CPCX can be designed with a Combat System suite capable of defeating this threat. Threat scenarios were developed to estimate the expected threat the CPCX will encounter beyond an IOC of 2010.

The future threats located on page (A-3) were provided by the faculty advisors. From these future threats, the design teams identified the projected threat environments and selected the possible threats that may be encountered in each environment. The threats were then broken down by specific service. The Navy threat scenarios are located on page (E-4) and the Coast Guard threat scenarios are located on page (E-6). The following letter scale was used to evaluate each specific threat based on the probability of encountering and the capability of that specific threat.

AA - High probability of encountering/High capability threat
AB - High probability of encountering/Low capability threat
BA - Medium probability of encountering/High capability threat
BB - Medium probability of encountering/Low capability threat
CA - Low probability of encountering/High capability threat
CB - Low probability of encountering/Low capability threat
DA - Very Low probability of encountering/High capability threat
DB - Very Low probability of encountering/Low capability threat

Future Threats

Missiles:
A= anti-ship missile, M= other missile

Designation	Cruise (Mach)	Altitude(ft)	Range (nm)	RCS (dB)	Notes
A-1	4.0	150,000	200	-40	RF(active & passive)/IR/video seeker 60 deg dive angle
A-2	2.0	50	100	-40	10g termnvr/IR/video seeker terminal alt. 7 ft
A-3	0.9	20	75	-30	Multiple termnvr/RF/IR seeker A/J
A-4	0.9	10	60	-20	RF seeker A/J
M-1	2.5	LOS	2.5	-45	IR shoulder or multi launcher
M-2	3.5	Various	100	-40	air launched ARM

	Populations: (% of total missile populations)	Distribution: (who owns, # of nations, assuming 250 littoral nations)
A-1	5	10
A-2	20	50
A-3	50	187
A-4	25	50

Guns:
Small arms through 127mm, guided (IR/Laser/RF) and ballistic, ETC and standard propellant.

Mines:
Bottom. moored, floating. All influences

Torpedoes:
Surface and sub launched. Speeds to 80 kts. Contact/magnetic/acoustic triggers.

Misc.:
Mortars, grenades, etc., Chemical and biological agents dispersed through various vectors/methods.

Note:
All ASCMs may be launched from air, surface, or subsurface platforms. Any torpedo may be launched from any submarine.

Navy Threat Scenarios

1. Independent Operations:

- Constitutes the high end of low intensity conflict.
- Conduct law enforcement, board and search, drug operations, blockade, Freedom of Navigation (FON), show the flag, Special Operations Force (SOF), intelligence operations, etc. Primarily littoral environments.
- Operate at long distances from the battle group which can also be considered independent operations.
- Reduced signatures are needed for inherent self-defense capability.
- Threat of three missiles in one minute (AA)
- ASCM threats will originate from small fishing vessels and small hostile combatants A-1 (CB), A-2 (CA), A-3 (BA), A-4 (BA)
- Other missiles: M-1 (BB), M-2 (BA)
- Guns (AB)
- Mines (BA), the CPCX may be conducting mine hunting ops.
- Diesel/electric submarines (BA)
- Will likely see a single threat in a single medium (ie. one airplane, one submarine, one missile) vice several threats from various areas.
- CPCX will spend a significant portion of its time at sea conducting independent operations.
- Must have adequate ship self-defense to protect itself.

2. Group operations without AEGIS support:

- Part of ARG or SAG (non-Aegis)
- Significant contribution to the fleet will include ASW capability, early warning air detection, and mine hunting.
- CPCX in this scenario will be conducting ASW, escort ops, and/or mine hunting
- These scenarios tend to be more blue water oriented. (No matter how "littoral capable" we design the CPCX it will still be expected to operate in blue water with the fleet.)
- CPCX will operate along threat axis (50-150 mi.) ahead of group.
- The CPCX will not have the support of Aegis cruiser/destroyer.
- Air defense (if required) will be provided by missile shooters (NTU CGN, DD with VLS, FFG)
- Mines (CA) less likely in this scenario. (blue water nature)
- The probability of seeing missile A-1 (DA)
- ASCM threat: A-2 (AA), A-3 (AA), A-4 (AA)
- Other missile threat: M-1 (DB), M-2 (AA)
- Missile M-1 is very short range and difficult to counter.
- Missile threat includes three incoming missiles in one minute.
- Diesel/electric submarines (AA)
- Guns (AB)
- This scenario will be the most demanding scenario for the CPCX. Other ships will be present, but CPCX will not have the Aegis umbrella for protection.

3. Group operations with AEGIS support:

- This scenario will be similar to above but the CPCX will have the assistance of an AEGIS cruiser/destroyer. Part of CVBG or SAG.
- Aegis will provide long range air search and air defense.
- CPCX will operate along threat axis (50-150 mi.) ahead of Aegis for ASW capability and early warning air detection an tracking. Can provide Aegis with "heads up" to possible incoming air attack.
- Missile threat is high, but the missile most difficult to counter A-1 (CA) will most likely be targeted for other platforms such as Aegis/CV/LHD, not CPCX.
- Missile threat: A-2 (AA), A-3 (AA), A-4 (AA), M-1 (DB) and M-2 (AA)
- missile M-1 and M-2 are very short range and difficult to counter
- Missile threat includes three incoming missiles in one minute.
- Diesel/electric submarines (AA)
- Guns (BB)

Coast Guard Threat Scenarios

1. Independent Operations: Routine ELT Patrol:

- Fisheries : belligerent fisherman using primitive small arms, large fishing vessels attempting to ram. Threats: M-1 (CB), small arms (BC).
- AMIO: large numbers of migrants, non-threatening unless actually aboard own vessel. Riot risk, possible takeover attempts (internal security issue). Threats: small arms (BC).
- Drug Interdiction/Smuggling/Piracy (AA): high speed surface and aircraft, equipped with high tech small arms, OTS (over the shoulder) missiles, rocket propelled grenades. Threat: A-4 (DA),M-1 (CB)
- Territorial/Sovereignty issues: Foreign governments desiring to make a "statement" concerning Freedom of Navigation issues, international waters fishing treaties (i.e. Recent Canada/Spain fishing rights dispute). May involve use of covert special forces aboard commercial vessels, using a few, but very potent high tech weapons. May also involve shore based threats (aircraft, missiles, gunboats, etc.) if operating near or in foreign littorals (but in international waters). Threat: A-3 (DA), A-4 (CA), M-1 (CB), M-2 (DB).
- Underwater Terrorism: In US port or foreign port, factions placing mines on ship. Terrorist swimmers harassing ship, trying to come aboard, trying to sabotage. Threat: mines (DA).

2. Low Intensity/Group Operations

- Support of limited invasion operations of Third World nations. In concert with other Navy/Coast Guard forces, generally in own hemisphere, i.e. Haiti, Grenada, Panama. May be first US asset on scene. Threats include aircraft and/or small warships (corvette size or smaller). Very limited high tech threats, but abundant weapons of 1990's technology. Threats: A-3 (CA), A-4 (CA), M-1 (BB), M-2 (CB).
- Foreign littorals: UN/US Economic sanctions, embargoes. Commercial ships that are intercepted may contain OTS missiles, small arms. Ramming also a possibility. Threats: M-1 (CB).
- Escort duties for allied shipping in US and foreign littorals. Threats include small surface/sub-surface craft, aircraft and mines. Threats: A-3 (CA), A-4 (BA), M-1 (AB), M-2 (CA). Harbor control duties in foreign ports in support of inland operations. Small surface/sub-surface craft, and mines are potential threats. Threats: A-4 (CA), M-1 (BB), M-2 (CB), and mines (BA)

3. Battlegroup Operations:

- Against First World high tech threats. Involvement limited to configuration capabilities. A-1 (CA), A-2 (CA), A-3 (CA), A-4 (BA), M-2 (CB), torpedoes (BB), mines (AA), misc. (BB)