Information Exchange Requirements (IERs)

SyntheSys Defence Ltd
St. Hilda's Business Centre
Whitby, North Yorkshire
YO22 4ET
tel: +44 (0) 1947 821464
email: training@synthesys.co.uk
web: www.synthesys.co.uk

James Norful

- Retired United States Air Force (USAF) 21 years
- Aircrew E-3A (NATO), E-3B/C (USAF) Sentry AEW
- Senior Surveillance Technician/Test & Evaluation Project
- Manager/Instructor/Evaluator
- Advanced JICC/JICO Course Graduate
- SyntheSys Defence Ltd.
- Senior Consultant
- Email: james_norful@synthesys.co.uk

AEW = Airborne Early Warning, JICO = Joint Interface Control Officer/Joint Information Coordination Centre

Introduction

- NATO combat operations require the exchange of tactical information between the involved participants on a real-time or near real-time basis.
- The exchange of real-time tactical information between Command and Control (C2) systems, weapon systems and intelligence systems provides mutual support, allows coordinated action and prevents interference between interfaced forces for the efficient and effective application of military force.
- This concept is applicable at all echelons of military action, whether single service, joint or combined operations.

IERs and TDL Planning

- The key, and by far the most difficult element of multi-link interface planning is determining the configuration for efficiently interconnecting the Command, Control, Communications, Computers, and Intelligence (C4I) and weapon systems using the various Tactical Data Links (TDLs) to satisfy the operational Information Exchange Requirements (IERs).

- What is an IER?

What is an Information Exchange Requirement?

- IER definition:

- IER applies to any required form of communication between two or more entities. Depending on the nature of the IER, it could occur over many different potential paths. The information exchange could be visual, audible, or electronic.

- This information must be exchanged between operational facilities in order to provide Commanders with essential information for decision making.

Network IER Requirements

- Network information exchange requirements represent the totality of what is commonly called network requirements. These requirements come from numerous domains, namely:
  - User operational requirements
  - Multifunctional Information Distribution System (MIDS) system requirements
  - TDL requirements
  - Spectrum requirements
  - Operating procedures requirements

User Operational Requirements

- Overall connectivity and information exchange requirements as provided by an authorised network requestor/user.

- Entails the major factors of information exchange that impact mission accomplishment such as:

  - Geographic area of operations
  - Force layout
  - Number and type of users
  - Multi-TDL environment
  - Special mission considerations
  - Commander’s intent

User Operational Requirements

- Will include listings of participants by:
  - Platform type and quantity
  - Connectivity (including relay requirement)
  - Capacity at the Network Participant Group (NPG) level

MIDS System Requirements

- The platform, terminal and often the platform’s Mission Support System requirements necessary to initialise in conformance with the platform’s Interface Control Document (ICD) and thus the platform's normal operations in a network.

- This includes the format and structure of each platform’s required Initialisation Data Load (IDL).

- Supported via the Network Design Facility (NDF).

TDL Requirements

- The requirements necessary to support the platform's participation in a function of a data link standard, such as:
  - Messages necessary to support an air control function, Electronic Warfare (EW), surveillance, etc.
  - Capacity representing a speed of service or protocol requirement

Spectrum Requirements

- Restrictions and operating conditions levied on MIDS network operations in a particular theatre or region controlled by a national authority.

- This includes technical requirements levied on the terminal for items such as:

  - Transmit duty factor
  - Frequency hopping integrity
  - Frequency bandwidth integrity

Operating Procedures Requirements

- Special circumstance procedures and temporary workaround for unconventional situations known to the planners, operators or design facilities, which allow platforms to function when otherwise they might fail.

- Example: A platform may require a function be present even though there is no other reason other than to conduct a successful IDL upload, or a platform may require a fixed net assignment when the normal mode would be stacked net configuration.

Operational IERs

- The Data Link Manager (DLM) defines the operational part of the IER by specifying:
  - Who
  - What
  - To whom
  - Why
  - How information is to be passed between planned participants

IER Characteristics

- IERs determine network design.
- Known IERs must be prioritised.
- The options and techniques used for meeting IERs lead to an incalculable number of potential network design solutions.
- The scope of the design challenge is eased by understanding the dual nature of IERs. Part of each IER is semi-static and the other part is dynamic.

IER Characteristics

- The semi-static nature of an IER exists long before a particular unit is tasked to execute a particular mission. Examples of the semi-static nature of an IER are:
  - A unit's core competency/ mission
  - A unit's Table of Equipment or Authorisation (T/E or TA)
  - A unit's Table of Organisation (T/O) or Unit Manning Document (UMD)
  - Systems' capabilities and limitations
  - The capabilities and limitations of each TDL

IER Characteristics

- The dynamic nature of IERs means IERs change as the situation changes.
- There are an infinite number of events taking place to change IERs and they can’t all be planned for in advance.
- As the friendly force, hostile force, and the non-combatant population situation becomes understood, the corresponding IERs become clear.
- As the friendly force, hostile force, and the non-combatant population situation changes, IERs will also change.

IER

- IER Identification
  - Commander’s intent
    - Operation Plan (OPLAN), Operation Order (OPORD)
  - Platform capability

- IER Prioritisation
  - Multi TDL Architecture (MTA)
  - Fulfillment of IERs
  - Network Design

IER

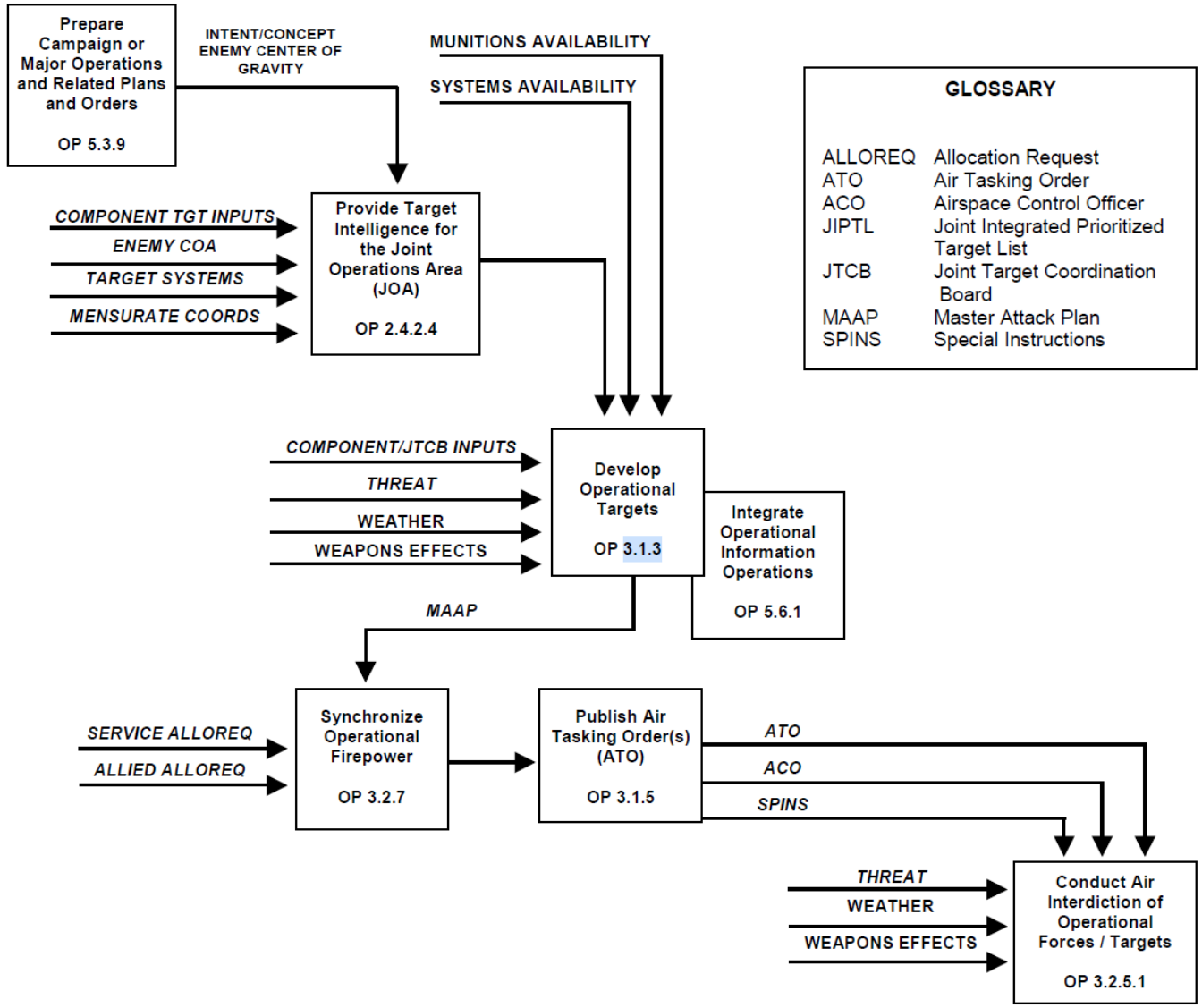
- IER Examples:

	TDL Capability	TDL Equipment	Communications/Crypto
• RC-135	Link 16 JREAP A/C	MIDS JTRS or Class 2H JRE	HF/UHF/VHF/SATCOM J-Voice KY57/KY75/KG250
• AWACS	Link 11 Link 16	JTIDS 2H (HPA) MIDS JTRS	HF/UHF/VHF/SATCOM J-Voice Chat capable IP Enabled Comms KG40A
• C2 Platform	Link 11 Link 16 Sat-J JREAP A/B/C	CDLMS NG-C2P JADSI JTIDS Class 2H AN/USQ-125 DTS	HF/UHF/VHF/SATCOM J-Voice KG40A/KG84A

IER Air Interdiction (AI)

- AI is air operations conducted to divert, disrupt, delay, degrade or destroy an adversary's military potential before it can be brought to bear effectively and at such distance that detailed integration of each air mission with the fire and manoeuvre of friendly forces is normally not required.

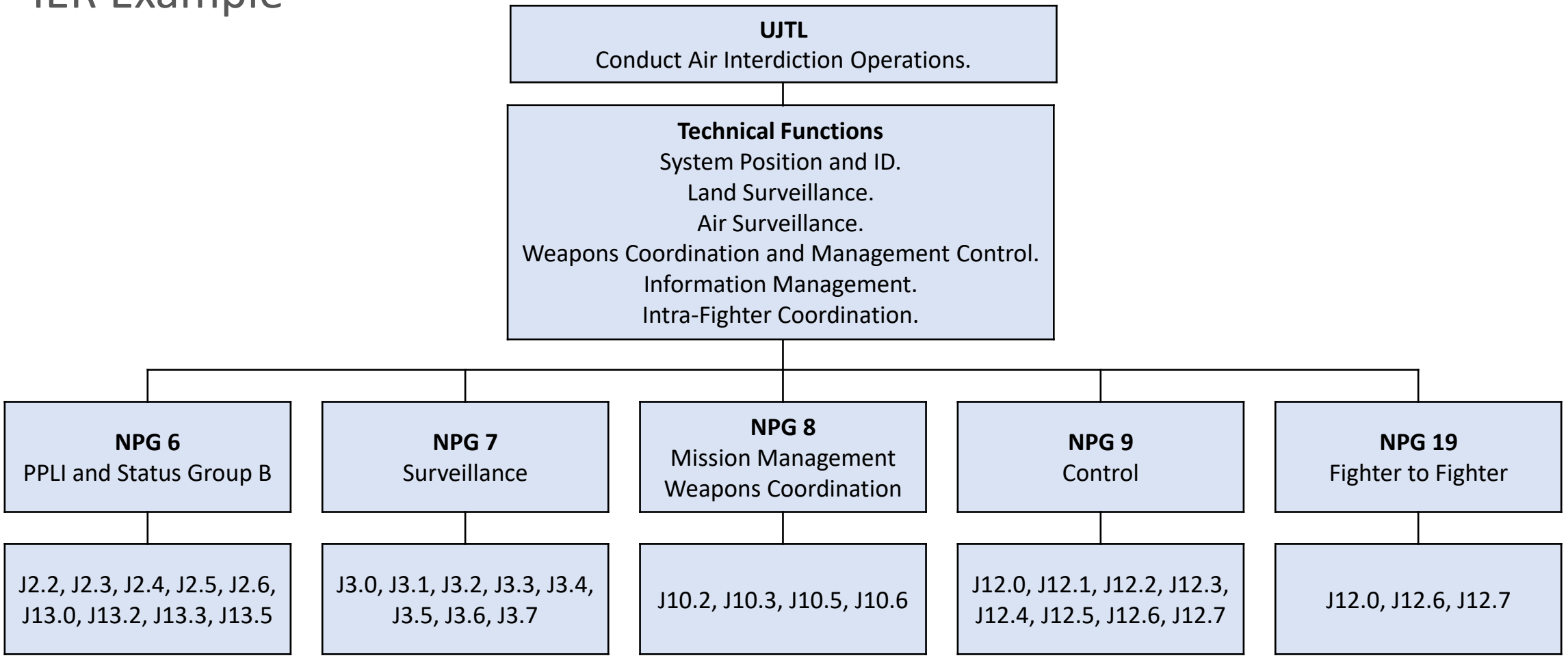
IER Air Interdiction (AI)



Information Exchange Requirements

IER

- IER Example



UJTL = Universal Joint Task List

IER Matrix

Information Exchange Requirements

1 Rationale/UJTL	2 Event/Action	3 Information Characterisation	4 Sending Node	5 Receiving Node	6 Critical
Set of Joint Mission Tasks from the Universal Joint Task List (UJTL).	Event or action requiring information to be exchanged.	Critical information characteristics describe what information is exchanged and how it is used.	Sending node.	Receiving node.	Critical assessment of information exchanged in relationship to the mission being performed.

7 Format	8 Timeliness	9 Classification	10 Tactics	11 Procedures	12 System
Description of data type.	Required maximum time from node to node, expressed in seconds.	Classification of information.	MTA/MTN TTP.	MTA/MTN TTP.	System specific requirements.

IER Matrix

- Field 1 – Rationale/Universal Joint Task List (UJTL)
  - Mission: Conduct Interdiction Operations - This is one of the UJTL Mission Essential Tasks that supports the overall Air Interdiction mission
- Field 2 – Event/Action
  - Fighter tasking, position updates

IER Matrix

- Field 3 – Information Characterisation
  - What information is being passed?
  - Convoy positions
  - F-15E uses J3-Series messages for land tracks

IER Matrix

- Field 4 – Sending Node
  - Sending units – E-8C
- Field 5 – Receiving Node
  - Receiving units – F-15E Strike fighter

IER Matrix

- Field 6 – Critical
  - What information is critical to the mission?
- Field 7 – Format
  - Message formats to be used? TDL in use – Link 11 M-Series, Link 16 J-Series

IER Matrix

- Field 8 – Timeliness
  - Time taken for the information to travel from the sending node to the receiving node
- Field 9 – Classification
  - Different levels of classification. In this AI example, the location of the convoy is considered SECRET

IER Matrix

- Field 10 – Tactics
  - Specific tactics to fulfil IER
- Field 11 – Procedures
  - Specific procedures to fulfil IER

IER Matrix

- Field 12 – System
  - System requirements

IER Planning Exercise

- You are the DLM/ICO for your Unit. Produce an IER for your Unit to submit to the Track Data Coordinator (TDC) for an upcoming exercise/operation/deployment using the abbreviated IER

- Example Scenario:

Defensive Counter Air (DCA) - “Conduct DCA along border area to defend areas IAW the Defended Assets List (DAL) from enemy air attack.” This tells the MTA planner that the MTA will need to support DCA IERs in a specific area (border and Defended Assets List (DAL))

- Platforms:

  CRC Nieuw Milligen, NATO AWACS, Typhoon SQ (Germany)

IER Planning Exercise

Information Exchange Requirements

Sending Node	Receiving Node	Information	Medium (Pri/Sec/Ter)	Message Format
CRC/DARS/ AWACS/Typhoon	CRC/DARS/ AWACS/Typhoon	PPLI	Link 16 (Pri) J-Voice (Sec) UHF (Ter)	J2.x, J13.x NPG 6 J-Voice NPG12/12 UHF Voice
CRC/AWACS	CRC/DARS/ AWACS/Typhoon	Enemy/Friendly Aircraft Positions		J3.2, J6.0, J12.5 NPG 7 J-Voice NPG 12/13 UHF Voice
CRC/DARS/ AWACS	CRC/DARS/ AWACS/Typhoon	Track Management		J7.x Series J-Voice NPG 12/13 UHF Voice
CRC/DARS/ AWACS	CRC/DARS/ AWACS/Typhoon	Command		J9.x NPG 8 J-Voice NPG 12/13 UHF Voice
CRC/AWACS	Typhoon	Mission Assignment		J12.x NPG 9 J-Voice NPG 12/13 UHF Voice
Typhoon	Typhoon/AWACS	Targeting Engagement		J12.6 NPG 6/19/20 J-Voice NPG 12/13 UHF Voice

Any Questions?

SyntheSys Defence Ltd
St. Hilda's Business Centre
Whitby, North Yorkshire
YO22 4ET
tel: +44 (0) 1947 821464
email: training@synthesys.co.uk
web: www.synthesys.co.uk