

FIPS LIFE CYCLE	Conceptual Phase	Requirements Definition Phase		System Design Phase		Development Acquisition and Integration Phase	System Test Phase	Deployment ,Installation, Ops and Maintenance Phase	
SYSTEM DEVELOPMENT LIFE CYCLE	Planning	Analysis		Design		Integration, Verification and Validation		Operations & Maintenance	
CTA SEM LIFE CYCLE	Functional Process Improvement Information Technology Planning	System Analysis & Functional Requirements Definition	System Architecture	High-Level Design	Detailed Design	Development & Integration	Test Validation & Implementation	Ops, Modifications, Maintenance, Conversions	
CTA SYSTEM ENGINEERING METHODOLOGY									
	<ul style="list-style-type: none"> Establish Enterprise Strategy Determine Enterprise Objectives Identify Key Enterprise Drivers 	<ul style="list-style-type: none"> Information Architecture Enterprise System Architecture Technical Architecture Knowledge Architecture 							
METHODOLOGIES	METHODS/TECHNIQUES/PROCEDURES	Ops Concept Analysis, Feasibility Study, Sensitivity Analysis, Business System Planning (BSP), Development, Life Cycle Model Analysis, Function Point Analysis, Net Present Value Analysis, Architectural Trade Studies, Business Planning, Systems Engineering Management, Functional Process Improvement, Business Process Reengineering (BPR), Risk Analysis	Structured Analysis, Object Oriented Analysis, Application Domain Analysis, Risk Analysis, Requirements Traceability, Development Life Cycle Model Analysis, Configuration Management (CM), Operation Concept Development, Cost/Benefit Analysis, QA, Function Point Analysis, E-R Diagram, FPI, Functional Analysis, IPT, Process Improvements Information Needs Analysis, Knowledge Engineering	User Interface Prototyping, Performance Modeling, Structured Analysis, Risk Analysis, Operations Concept Analysis, Performance Modeling, BSP, Normalization, Cost/Benefit Analysis, CM, Strength and Coupling Analysis, E-R, Diagrams, Sensitivity Analysis, Net Present Value Analysis, Make/Buy Analysis/RAD/JAD, Functional Prototyping, IPT, System Modeling, Architecture Specification, Knowledge Engineering	Performance Modeling, System Prototyping, User Interface Prototyping, Requirements Traceability, Structure Design, Risk Analysis, Domain Analysis, BSP, Normalization, Cost/Benefit Analysis, CM, Object Oriented Design, Structure Charts, Action Diagrams, Design Reviews, IPT System Modeling, Architecture Specification, Knowledge Engineering	State Transition Diagram, Control Structure, Data Structure Diagram, PDL, User Interface Prototyping, Object Oriented Design, Requirements Traceability, Design Walkthrough/ Inspections, Performance Modeling, Transaction Analysis, CM, Application Domain Definition, Structure Charts, Object Diagrams, Package/ Task Specifications, Action Diagrams, IPT	Configuration Management, Top-Down Incremental Development, PDL, Code Walkthrough/ Inspection, Performance Modeling, Requirements Traceability, Software Development Folder, Computer Based Instruction (CBI), Coding Standards/ Procedures, IPT	Auto Test Data Generation, Configuration Management, Black box/ White box Testing, Performance Modeling, Requirements Traceability, CBI, RCM, IPT, PIG, EDM, RCM	Help Desk, Trouble Shooting Teams, Operations and Maintenance (O&M) Development, Life Cycle, RCM, Ops Procedures, Data Integrity Procedures, User Access Procedures, Systems and Programming Release Procedures, Computer Protection Plan, Computer Security and Privacy Plan, IPT, PIG, EDMS
	TOOLS	CTAMS, CHIMES, SIP, VSF, ADW, IEF, IDEF, ERWINX, BPWIN, VISIO, Process Charter, Webporter, Framemaker, ECF, VTC, A/V, CTAMS Turbo BPR, ABT, Lotus Notes, Web Portals	DCACAS, PATB, RTAT, ATC, RCM, CHIMES, SIP, CCC, ADW, PVCS, VSF, IEF, VIASOFT ESW, IDEF, ERWINX, BPWIN, VISIO, Process Charter, Oracle Designer 2000, Framemaker, ECF, VTC, A/V, CTAMS ABT, Lotus Notes, Web Portals, ORACLE Developer	N2C, CHIMES, PATB, RTAT, ATC, IAMS, PPM, Demo II, CCC, SIP, ADW, PVCS, VSF, IEF, Power Builder, VIASOFT ESW, IDEF, ERWINX, BPWIN, VISIO, Process Charter, OD 2000, Framemaker, ECF, VTC, A/V, CTAMS, ABT, ORACLE Designer/ Developer	PATB, DCACAS, RIPL, RTAT, ATC, DB/A, Demo II, CCC, SIP, ADW, CODE-T, PVCS, VSF, IEF, Power Builder, VIASOFT ESW, IDEF, ERWINX, BPWIN, process Charter, OD 2000, Framemaker, ECF, VTC, A/V, CTAMS, ABT, ORACLE	PATB, ATC, RTAT, DCACAS, DB/A, SIP, Demo II, CCC, ADW, CODE-T, PVCS, VSF, IEF, Power Builder, VIASOFT ESW, IDEF, ERWINX, BPWIN, Process Charter, OD 2000, Framemaker, ECF, VTC, A/V, CTAMS, ABT, ORACLE	ATC, PATB, RTAT, DCACAS, DB/A, Compiler, CCC, Language Sensitive Editors, Debuggers, Documentation Generators, PVCS, SIP, VSF, ADW, CODE-T, IEF, Power Builder, VIASOFT, IDEF, ERWINX, BPWIN, Process Charter, OD 2000, Framemaker, ECF, VTC, A/V, CTAMS	PATB, RTAT, DCACAS, PVCS, CCC, SIP, VSF, ADW, CODE-T, IEF, Power Builder, VIASOFT, IDEF, ERWINX, BPWIN, OD 2000, Framemaker, ECF, VTC, A/V, CTAMS	Process Charter, Framemaker, ECF, VTC, A/V, CTAMS
ENGINEERING PRODUCTS	Systems Engineering Management Plan, Concept Desc, Feasibility/ Trade Studies, Cost/Benefit Anal, Mission Needs Statement, Enterprise Modeling, Technology Assessment Report, Monthly Project Stat Prog Report, HW/SW Assessment Report, Sys Design Paper, Program Mgr's Charter, Mgmt Plan, Privacy Plan	User Rqmts Anal, Syst/ Functional Rqmts Spec, RCM, Project Plan, Data Rqmts Doc, Quality Assurance Plan, Configuration Mgmt Plan, HW/SW Survey, Prototype Report, Project Status Progress Report, SW Devel Plan, Trade Studies, SW Transition Plan, Interface Rqmts Spec, Program BL Doc, Acquisition Interface Rqmts Spec, Program BL Doc, Acquisition Anal Doc, Anal of Alternatives Doc, Economic Anal, life Cycle Cost Est, Independent Cost Est, Lease vs. Purchase Anal, SW Conversion Study, Lessons Learned	Sys Architecture, Def, ICDs, Sys Spec, Sys/Subsys Spec (Draft), Preliminary SW Rqmts, Data Dictionary, Project Status Progress Report, RIM Test Scenarios, Sys/Subsys Spec, Firmware Suprt Man, Data Comm Plan, Standardization & Interoperability Plan, Functional Desc, Lessons Learned	Sys/Subsys Spec, DB Spec, Timing and Sizing Anal, Sys/ Display Prototypes, Trade Studies, Preliminary SW Design, SW Test Plan, Preliminary I/F Design Doc, SW Rqmts Spec, Sys/Subsys Design Desc, SW Design Desc, DB Design Desc, SW Input/Output Man, Interface Design Desc, Tech Sped, Logistics Plan	Program Spec, SW Design Doc, I/F Design Doc, SW Test Desc, Operations Man, Reference Man, Sys Admin Man, Project Status Progress Report, Sys/Subsys Design Desc, Sys/Subsys Design Desc, SW Install Plan, Test & Eval Plan, Sys Security Plan, Implementation Plan, Lessons Learned	Applications SW, SW Development, Folders, Structured Code, Source Code Listing, Source Code, SW Test Procedures, Program Maintenance Man, Student Handbook, SW Users Man, Computer Programming Man, SW Test Plan, Training Plan, Transition Plan Lessons Learned	Test Procedures, Test Data Sets, Test Results DB, Test Anal Reports, Update Source Code, SW Product Spec, Product Baseline, Implementation Plan, SW Test Report, SW Version Desc, SW Product Spec, Test Results Report, SW Test Desc, Lessons Learned	Service Eval Report, SW Center Operator Man, Computer Operation Man, Project Status Progress Report, Post Development Support Plan	
CTA ENGINEERING PROCESSES	<ul style="list-style-type: none"> Database Engineering Ops Concept Engineering Life Cycle Engineering Project Planning INFOSEC Risk Analysis/Mitigation FPI/BPR/IPI EDI 	<ul style="list-style-type: none"> Requirements Decomposition Human Factors Engineering Performance Allocation Database Modeling BPR/FPI Risk Analysis & Mitigation Cost Estimating Security Analysis 	<ul style="list-style-type: none"> Requirements Allocation Performance Modeling Standards/Protocols Analysis BPR/FPI EDI Risk Analysis/Mitigation Security Engineering 	<ul style="list-style-type: none"> Design Implementation Human Factors Database QA/CM JAD/RAD BPR/FPI Design Reviews EDI 	<ul style="list-style-type: none"> Design Reviews Performance Analysis JAD/RAD QA/CM Design Walkthrough BPR/FPI EDI 	<ul style="list-style-type: none"> RMA Engineering Implementation Engineering QA/CM Code Reviews Design Walkthrough BPR/FPI EDI 	<ul style="list-style-type: none"> Integration Engineering RMA Engineering Facility Engineering QA/CM Test BPR/FPI EDI 	<ul style="list-style-type: none"> RMA Engineering Re-Engineering QA/CM Engineering Change Control BPR/FPI EDI 	