The System Acquisition Process

System acquisition is a process. It has a beginning and an ending. "'Systems acquisition' means the design, development, and production of new systems. It also includes modifications to existing systems that involve redesign of the system or subsystems."[1] This reading will introduce you to the Army's system acquisition process. It will serve as an overview and preparatory for the Army Acquisition Basic Course. Review questions are placed at the end of this chapter. You should be able to answer all questions prior to the first class. The review questions will relate to the learning objectives.

Links have been inserted throughout the text to enable you to quickly access definitions. It will help if you first click on the View portion of the toolbar, select Toolbars, and then select Web. To access a link or definition, move the cursor over the underlined expression, press and hold the Control key as you click the left mouse button. You will note that a green arrow appears on the far left of the Web toolbar. After you have accessed and read the definition of a term, you may click on the green arrow to return to the exact place in your text from where you accessed the hyperlink. This feature is being incorporated into other readings.

Objectives

1. Describe the environment surrounding system acquisition.
2. Name the six basic activities in system acquisition.
3. Know what the reasons are for starting a new acquisition program.
4. Describe the milestone decision review.
5. Name the five DoD life cycle phases.
6. Recall the scope or purpose of each life cycle phase.
    a. Concept Refinement
    b. Technology Development
    c. System Development and Demonstration
    d. Production and Deployment
    e. Operations and Support
7. Describe risk.
8. List three broad categories of technological maturity.
9. Know during what life cycle phases is it appropriate to insert mature technology.
10. Know what, "cooperative opportunities" are as related to the research and development process.
11. Know what other name is given to the DoD Strategic Plan?
12. Know what it means to have a, "baseline."
13. Define:
    a. Systems acquisition process
    b. Milestone decision authority (MDA)
    c. Acquisition Decision Memorandum (ADM)

[1] DFARS, Part 234, *Major System Acquisition*.

d. Exit criteria
e. Acquisition Program Baseline (APB)
f. Analysis of Alternatives (AoA)
g. Capabilities Development Document (CDD)
h. Key performance parameter (KPP)
i. Critical program information (CPI)
j. Acquisition strategy (AS)
k. Modeling and simulation (M&S)
l. Test and Evaluation Master Plan (TEMP)
m. Initial Operational Test and Evaluation (IOT&E)
n. Live Fire Test and Evaluation (LFT&E)
o. Capabilities Production Document (CPD)
p. Critical Design Review (CDR)
q. Dual use technology
r. Commercial off the shelf (COTS)
s. Initial operational capability (IOC)
t. Interoperability
u. Low rate initial production (LRIP)

The System Acquisition Environment

> "We the people of the United States, in order to form a more perfect union, establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America."[2]

Americans seldom argue about the need for a strong military. From virtually every walk of life within the United States, we acknowledge our Government's responsibility to provide for a strong national defense. As noted in the Preamble cited above, our Constitution explicitly identifies the Federal Government's national defense responsibility. Within this general agreement, we frequently disagree about how much defense is actually needed. Examples are:

- How many Army divisions should be maintained? What kind of divisions?
- Do we need a replacement for the M-109 Paladin howitzer?
- Why did the Army's anti-ballistic missile fail during testing? Is this a sign that the program should be cancelled?
- Should we replace our M-1 main battle tanks with wheeled armored vehicles?
- Who should pay for the international peacekeeping missions assigned to the U.S. Army?
- How much and which technology should we adopt? Adding technology improves system capabilities but we cannot afford to adopt every new technology as it becomes available.

[2] *Preamble to the Constitution of the United States of America*.

- Given that the size of the Army has been greatly reduced, which Army posts should be closed?

As you can see by these examples, even people who agree that we should have a strong military can and will disagree over a number of significant issues. Factors contributing to these disagreements are:

1. Lack of unity on what constitutes our country's national interests. National interests encompass a wide variety of concerns. Examples are: trade relations with other countries, influx of illegal drugs into the United States, ability to freely travel the high seas, availability of oil, and one country invading another country. These are examples of things that comprise our national interests. On each issue, our elected representatives will disagree about its funding priority and how best to resolve the issue.

2. Determining what is the optimum mix (size and capabilities) of the military departments (Army, Navy [including Marines] and Air Force). Without clear mission delineations, the military departments are put into a position of having to compete with one another for mission and accompanying resources, especially among overlapping missions.

3. Competing interests for public funding. Each member of Congress seeks tax dollars (public funding) for their district or state. Creating and maintaining jobs for their constituents is a powerful incentive for an elected official. Some members of Congress have even added to the number of ships and planes originally requested by the Department of Defense. Not surprisingly, the companies producing these military items were located in the district or state of that Congressional member demanding an increase in quantity. Additionally, our nation's political leadership frequently debate over how best to spend public funding among the U.S. government's departments. A listing of the President's cabinet-level departments follows.

Cabinet-level Departments	
▪ Agriculture	▪ Interior
▪ Commerce	▪ Justice
▪ Defense	▪ Labor
▪ Education	▪ State
▪ Energy	▪ Transportation
▪ Health and Human Services	▪ Treasury
▪ Homeland Defense	▪ Veteran's Affairs
▪ Housing and Urban Development	

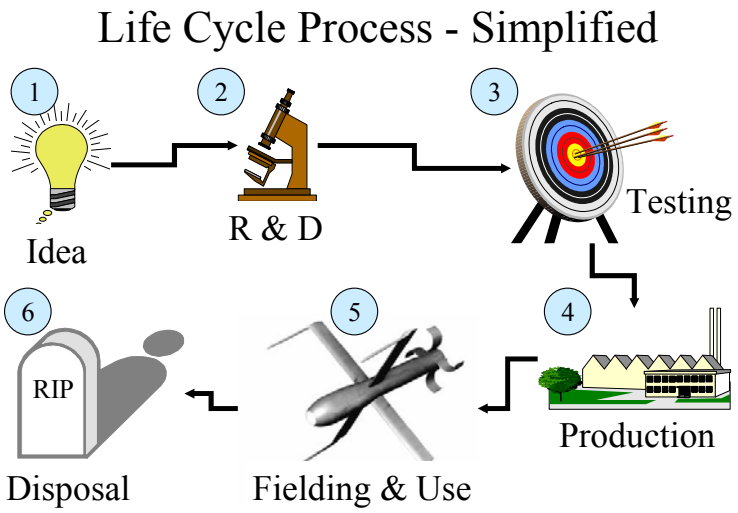
For example, should we spend additional tax dollars for education, prescription drugs, bolster Social Security, improve highways, and add more public housing? Or should we spend more money on national defense? Remember, we don't have enough money to fully fund every need. This issue occupies a great deal of our elected leaders' time and is often at the center stage of state and national election campaigns.

Boeing Lands $9.7 Billion C-17 Contract Aerospace: The Pentagon order will help keep the Long Beach production line open until 2008 and keep 7,000 workers employed.
[Los Angeles Times, August 16, 2002]
Boeing Co. got a much-anticipated order to build 60 additional C-17 transports under a $9.7 billion Pentagon contract.

Hardly a day goes by without national or international newspaper or television coverage of some weapon system being developed or purchased by the Department of Defense. These articles may announce the results of a missile test, discuss a huge cost overrun, or divulge which contractor won the right to build a new weapon system, etc. (Note the typical example.)

The news media covers our system acquisition process because so much public funding is spent on developing and buying new weapons. If the news concerning a particular weapon is especially bad (e.g., a system failed a test during which soldiers died), we will get even more coverage! News coverage influences public opinion on our national defense priorities. News media frequently conduct and publish polls purporting to show our nation's leadership what the people are thinking. Also, by swaying considerable numbers of the American public, these citizens, in turn, contact their elected representatives. Sadly, few Americans really understand system acquisition. This includes most members of the news media. However, to exclude the news media as an influence on American national defense would be to ignore reality.

The Acquisition Process – Simplified



The life cycle process shown in this chart applies to any product created for sale. A new weapon system, computer software program, surgical instrument, woman's make-up, or a space ship - all have this process in common. Understanding these six basic activities is the first step in understanding the Army acquisition process.

The six basic system life cycle activities:

1. What is an **idea**? Simply stated, an idea is an inspiration for something different. Few products were ever made available to the consumer without going through this step. For example, knives have evolved from stone, to bronze, to iron, to steel and to

stainless steel. Somebody having an idea for improving the knife caused each evolution or material change.

Alternatively, some products have been discovered by accident. For example,

A Brief History of the Microwave Oven

Like many of today's great inventions, the microwave oven was a by-product of another technology. It was during a radar-related research project around 1946 that Dr. Percy Spencer, a self-taught engineer with the Raytheon Corporation, noticed something very unusual. He was testing a new vacuum tube called a magnetron, when he discovered that the candy bar in his pocket had melted. This intrigued Dr. Spencer, so he tried another experiment. This time he placed some popcorn kernels near the tube and, perhaps standing a little farther away, he watched with an inventive sparkle in his eye as the popcorn sputtered, cracked and popped all over his lab.

The next morning, Scientist Spencer decided to put the magnetron tube near an egg. Spencer was joined by a curious colleague, and they both watched as the egg began to tremor and quake. The rapid temperature rise within the egg was causing tremendous internal pressure. Evidently the curious colleague moved in for a closer look just as the egg exploded and splattered hot yoke all over his amazed face. The face of Spencer lit up with a logical scientific conclusion: the melted candy bar, the popcorn, and now the exploding egg, were all attributable to exposure to low-density microwave energy. Thus, if an egg can be cooked that quickly, why not other foods? Experimentation began...

Dr. Spencer fashioned a metal box with an opening into which he fed microwave power. The energy entering the box was unable to escape, thereby creating a higher density electromagnetic field. When food was placed in the box and microwave energy fed in, the temperature of the food rose very rapidly. Dr. Spencer had invented what was to revolutionize cooking, and form the basis of a multimillion dollar industry, the microwave oven.

Source: http://www.gallawa.com/microtech/history.html

2. The second activity is conducting **research and development** (R&D). Research is defined as, "investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in light of new facts, or practical application of such new or revised theories or laws."[3] Development is defined as, "the process of working out and extending the theoretical, practical, and useful applications of a basic design, idea, or scientific discovery."[4] Individuals, groups, governments or companies will offer an idea, along with funding, to selected members of the world's scientific community for experimentation and resolution.

[3] *Webster's New Collegiate Dictionary.*
[4] *DSMC Dictionary*

Sometimes the scientific community cannot readily find a solution. For example, there is no known cure for the common cold. There are medicines available that will treat the symptoms and help the patient feel better, though. In other cases, the scientific community will find a solution and offer a product to its customer. An example is placing satellites in geo-stationary orbit to serve as communication relay platforms. This has enhanced global communication.

3. The third activity is **testing** the solution. Can you imagine a pharmaceutical company selling a new drug without rigorous testing? What if an aircraft company produced a new airplane and elected to omit its flight-testing? Neither of us can imagine this happening. The consequences of failure are too great – especially given the number of lawyers available!

4. The fourth activity is **production**. It makes no sense to develop a new product and then decide to withhold it from customers. Each year, industry spends billions of dollars on research and development. The only means of recouping their investment is to produce the product so that it can be sold to consumers. Their research and development costs are added to the cost of the product. This enables industry to be reimbursed for their research and development expenses.

5. The fifth activity is product **distribution and use**. Industry markets and distributes their products to consumers. In some industries, marketing and sales accounts for a significant percentage of total product cost. After purchasing a product, consumers use the product in some fashion. The consumption duration may be a few minutes or many years. For example, an amusement ride may take less than one minute but a piece of artwork may endure for centuries.

6. The final activity is **disposal**. Disposal occurs when the item is no longer wanted. A wrecked automobile may be consigned to a junkyard where it will be crushed and sold as scrap metal (recycled). An empty egg carton and a lipstick tube may be hauled away and buried in some landfill.

These are the six essential activities in any system life cycle process. We will spend the duration of this course examining and embellishing these essential activities. You are expected to learn how the Army applies these activities to its system acquisition process. Note: The Army acquisition process concentrates on the first four activities. However, the fifth and sixth activities must be included in the overall program strategy. Another name for the system life cycle process is, "the life cycle system management model (LCSMM)."[5]

[5] *The Life Cycle System Management Model (LCSMM), DA PAM 11-25*, 1975 (obsolete publication)

The Life Cycle Model

This reading outlines the process of acquiring a new Army system. It is important that you understand that no two systems are acquired in exactly the same manner. Each acquisition program is somewhat unique. For example,

- One program may require more research and development while another may consist of purchasing a commercial item to satisfy a military need.
- An established project office may operate under a set of acquisition policies published three years ago while a newer program is subject to revised policies.
- A specific system may be urgently needed in the field while another may not have the same urgency. The program manager for the urgently needed system may be permitted to omit some events that are usually required.

Key Program Drivers

There are two valid reasons for starting a new acquisition program. One is overcoming a **threat** to our nation or its military forces and the second is incorporating **new technology** that will increase our military capability or reduce operating and support costs.

1. **Threat** includes:

a. Determining what nation or organization will pose a future threat to the United States' national interests. During the Cold War (2 September 1945 – 26 December 1991), the Soviet Union and Warsaw Pact posed the principal threat to the United

States and its allies. We developed forces and systems to counter threats from those countries with the belief that other threats to our national interests could be neutralized using the same forces and equipment created to counter threats posed by the Soviet Union and Warsaw Pact. Since the end of the cold war, determining threat has become much more complicated. No nation has recently fielded huge armies and produced a vast array of weapon systems aligned against our forces and those of our allies. However, the varieties of potential threat to our national interests have multiplied during the past ten years.

b. Accurately projecting technological advances by our own industry, our allies, and potential enemies. Technology advances in a predictable manner. Our technology forecasters, using a history of previous technological advances and projections of future research and development funding, are able to predict what technologies will be available in the world tomorrow. Because of enhanced global communication and trade, the newest technologies are more readily available throughout the world. Nations are assimilating these newer technologies in their weapons more rapidly than ever before. You can argue that their most limiting factor is their ability to afford the weapons with the latest technology. Still, newspapers tell of rogue countries (potential enemies) building up their military at the expense of their citizen's well being. In fairness, some Americans say the same thing about our country – especially those who want to spend more money on social programs at the expense of new weapon systems. Fortunately, the Army acquisition workforce is not required to debate this issue!

2. Incorporating **new technology** is another driver in the acquisition process. Without threat, the principal reasons for adopting new technology for our defense forces are to:

   a. Increase the capabilities of an existing system. This typically gives our forces added or enhanced ability to carry out assigned missions. An example is installing a global positioning system on a vehicle. Having an accurate and up-to-the-minute knowledge of the vehicle's location helps the driver arrive at his or her destination in the shortest time. This avoids mission delays caused by having to stop and consult a map, ask directions, backtrack to avoid obstacles, etc.

   b. Decrease the operational cost of an existing system. For example, we may adopt a new engine for a weapon system to obtain greater fuel economy or to reduce engine maintenance costs.

These acquisition program drivers are put into priority each year and must compete with other defense programs for funding.

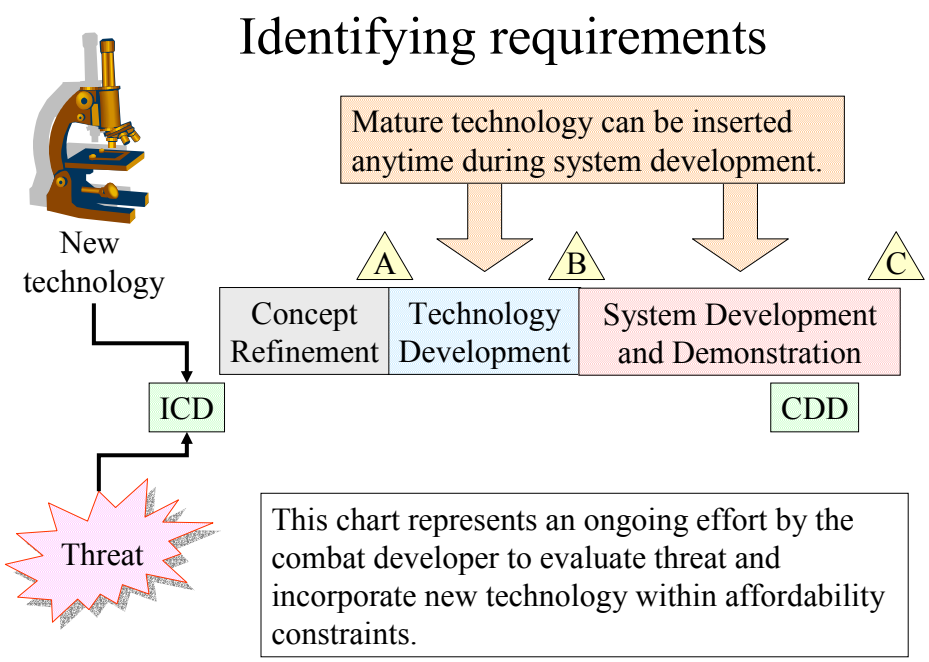
Before the life cycle model begins

Selected Army organizations have specific acquisition assignments. The combat developer (CBTDEV) is responsible for developing conceptual requirements for new

systems or modifications to existing systems. This is named the Joint Capabilities Integration and Development System (JCIDS).

JCIDS examines multiple concepts and alternatives to optimize the way the Department of Defense provides these capabilities. The examination includes robust analyses that consider affordability, technology maturity, and responsiveness. Technologists and industry identify and protect promising technologies in laboratories and research centers, academia, and commercial sources; reduce the risks of introducing these technologies into the acquisition process; and promote coordination, cooperation, and mutual understanding of technology issues. Conducting Science & Technology (S&T) activities should not preclude but facilitate future competition.

The combat developer is responsible for conducting analyses of existing and future desired capabilities. The analyses look across DoD component boundaries for solutions in order to avoid duplication. The process may also begin with identifying opportunities to exploit technology breakthroughs that provide new capabilities that address established needs, reduce ownership costs, or improve the effectiveness of current equipment and systems. A mission need analysis should identify the time-based nature of the need and identify the specific time frame the need is expected to exist. This includes current and projected needs.



Before the combat developer can submit a requirement for a new system or to modify an existing system based on projected threat, non-materiel alternatives must be examined. Why is a non-materiel solution preferred? Non-materiel alternatives are normally cheaper to get and quicker to implement.

Non-Materiel Alternatives
1. Changing military doctrine or tactics. Doctrine evolves as a body of thought that consolidates the Army's collective wisdom regarding past, present and future. 2. Providing more intense or better training to soldiers is a means of increasing combat power. 3. Enhancing leader development. Leader development is a continuous, progressive, and sequential process through which Army leaders will acquire the skills, knowledge, and behavior necessary to maintain a trained and ready army in peacetime to deter war. 4. Change the organization. Organizational requirements are documented through a series of connected and related processes. Organizations have their beginnings in warfighting concepts.[6] These concepts provide the basis for the proposed organization and address a unit's mission, functions, and required capabilities. 5. Improve the personnel. Personnel requirements include additions, deletions or modifications to the Army's military occupational specialty (MOS) system.

If non-material alternatives are not feasible, the combat developer drafts a materiel requirements document. All documentation and procedures must comply with Chairman of the Joint Chiefs of Staff Instruction (CJCSI 3170.01 Series), *Joint Capabilities Integration and Development System*.

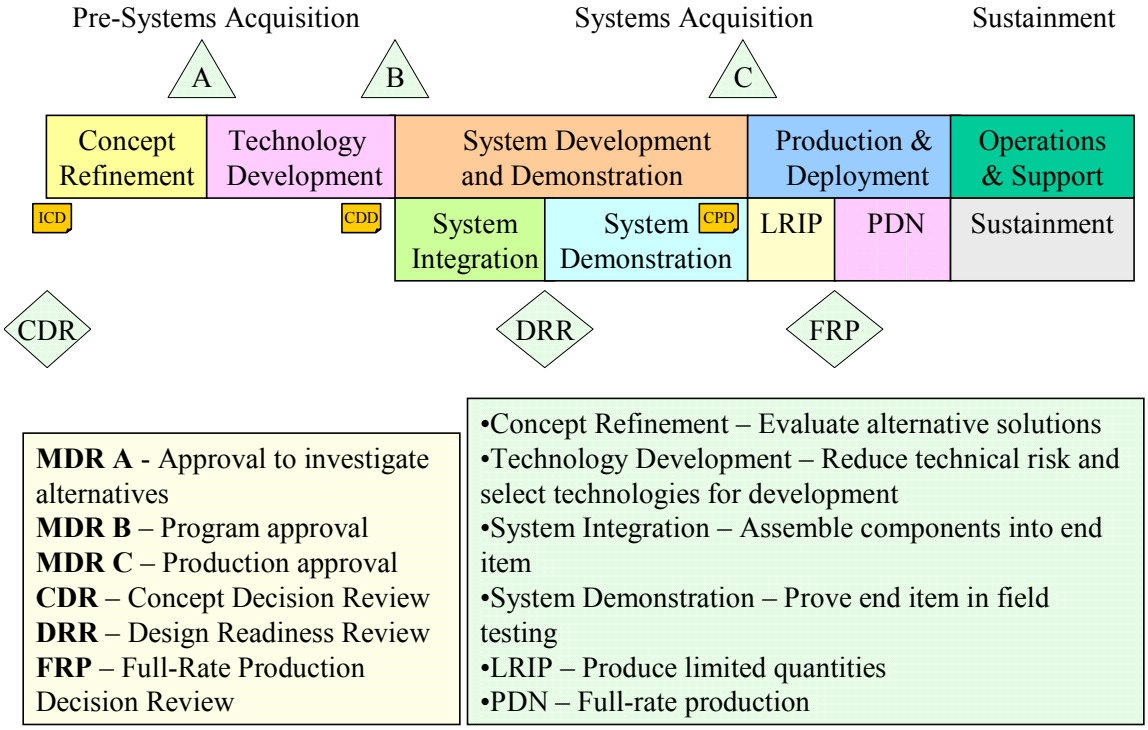
The first requirements document prepared is the **Initial Capabilities Document (ICD)** The ICD describes materiel capabilities in broad, time-phased and operational goals. The ICD document is written to accommodate the widest range of possible materiel solutions. After the ICD has been approved, a lead service will be designated to investigate the possible system alternatives. For example, the Army may be designed as a "lead service" for a specific program. Another military service wishing to acquire the system would be a "follower service."

Life Cycle Phases

The Department of Defense has divided its life cycle model into five phases. Each phase represents logical starting and ending points that comply with Federal Law. The DoD life cycle model is much more complicated than the simple 6-step model discussed earlier. There are two reasons: (1) a large body of acquisition policies (rules) that must be followed and (2) the many people and organizations involved in system acquisition.

[6] Warfighting concepts are the Army's "blueprint" for determining DTLOMS requirements across the combined arms and services team.

THE LIFE CYCLE MODEL



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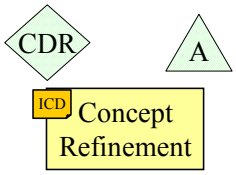
Milestone Decision Review (MDR) - Each phase of the acquisition process is preceded by a milestone decision review. "The milestone decision authority (MDA) must have a balanced assessment of a program's readiness to proceed into the next acquisition phase. Review forums may be formal or informal at the discretion of the MDA."[7] The milestone decision review serves as a top-level management review designed to evaluate the proposed system against all other planned expenditures. It is important to note that programs vary greatly in terms of cost and technical complexity. Consequently, programs are grouped according to type, cost and complexity.

Program documentation is required throughout the system acquisition process. The vast amount of mandated documentation is legendary. Even during efforts to reduce the number of policies governing the system acquisition process, a huge array of data is still prepared to manage and justify the program. See Table A and Table B for details.

[7] AR 70-1, Army Acquisition Policy

THE LIFE CYCLE MODEL– 1ST PHASE



Purpose or scope:
•Refine the initial concept and develop a Technology Development Strategy (TDS)

Major activities:

•Milestone decision authority issues ADM.
•Army awards development contracts.
•Integrated concept team evaluates alternatives (AoA).
•AoA refines the given material solution, results are due at Milestone A
•TDS is developed as part of the Acquisition Strategy

The purpose of the Concept Refinement Phase is to refine the initial concept and develop a Technology Development Strategy (TDS).

The phase begins with a Concept Decision Review (CDR). At the concept decision, the milestone decision authority (MDA), with an ICD from the user community, will approve the Acquisition Decision Memorandum (ADM) to enter Concept Refinement. The MDA will also approve the Analysis of Alternatives (AoA) plan and ensure funding for the phase. The MDA will designate a lead DoD Component (Army, Navy, Air Force or Marines), and approve Concept Refinement exit criteria. The leader of the integrated concept team (ICT), working with the integrated test team, develops an evaluation strategy that describes how the capabilities in the ICD will be evaluated once the system is developed. A favorable concept decision does not yet mean that a new acquisition program has been initiated.

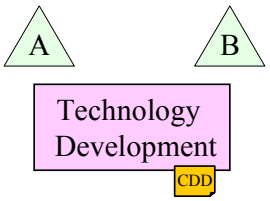
Entering the Concept Refinement Phase depends upon:

1. A validated and approved ICD resulting from analyzing potential concepts across the DoD Components, international systems from Allies, and cooperative opportunities;
2. And an assessment of the critical technologies associated with these concepts, including technology maturity, technology risk, and, if necessary, technology maturation and demonstration needs.

The **Concept Refinement** phase typically consists of competitive, parallel, short-term concept studies guided by the ICD. The focus of these studies is to refine and evaluate the feasibility of alternative solutions to the initial concept, and to provide a basis for

assessing the relative merits of these solutions. Analyses of alternatives (AoA) are used to facilitate comparisons. In order to achieve the best possible system solution, emphasis is placed on innovation and competition. To this end, participation by a diversified range of businesses is encouraged. For business applications, the Principal Staff Assistant (PSA) shall consider existing commercial-off-the-shelf functionality and solutions. Technological risk will be addressed throughout research and development. See the terms: risk and dual use technology and read the discussion on risk. Concept Refinement ends when the milestone decision authority selects the preferred technology to be pursued.

THE LIFE CYCLE MODEL – 2ND PHASE



Purpose or scope:
•Reduce technology risk; determine the appropriate technologies to be integrated into a full system

Major activities:

•Development of a system architecture.
•Risk reduction on components and subsystems.
•Develop draft performance specification.
•Develop overall acquisition and T&E strategy.
•Prepare Capability Development Document.
•Formulate initial Acquisition Program Baseline
•Complete Test & Evaluation Master Plan.
•Prepare life-cycle/independent cost estimates.
•Ensure full funding in FYDP prior to MS B.
•Army appoints a program manager before Milestone B.

The **Technology Development** phase is a continuous technology discovery and development process reflecting close collaboration between the user and the system developer. It is an iterative process designed to assess the viability of technologies while simultaneously refining user requirements.

The project enters Technology Development when the project leader has a solution for the needed capability and understands the solution is a part of the integrated architecture. Integrated architecture encompasses doctrine, organization, training, material, leader development, personnel and facilities (DOTMLPF). Technology Development reduces technology risk and determines the set of technologies to be integrated into a full system. This work effort is normally funded only for the advanced

development work. A cost assessment is prepared in lieu of an independent cost estimate (ICE) and a preliminary assessment of the maturity of key technologies is provided.

The Initial Capabilities Document (ICD) guides this work effort during the Technology Development Phase. Multiple technology development demonstrations may be necessary before the user and developer agree that a proposed technical solution is affordable, militarily useful, and based on mature technology.

If time-phased (incremental) requirements are used, the initial capability only partially fulfills the overall capability described in the ICD and successive technology development efforts continue until all capabilities have been satisfied. In a spiral development process, identifying and developing the technologies for follow-on increments continues in parallel with acquiring increments (portions of the system), allowing the mature technologies to more rapidly proceed into System Development and Demonstration.

The project exits Technology Development when

- An affordable increment of militarily useful capability has been identified,
- The technology for that increment has been demonstrated in a relevant environment,
- And a system can be developed for production within a short timeframe (normally less than five years);
- Or when the MDA decides to terminate the effort.

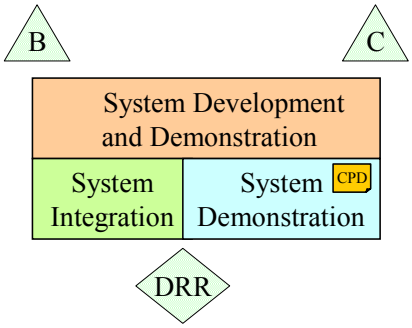
During Technology Development, the user prepares the Capability Development Document (CDD) to support subsequent program initiation and to refine the integrated architecture.

The Army may appoint a program manager after determining the type system proposed for development. After the program manager is appointed, the Integrated Concept Team may be disestablished.

A Milestone B decision follows the completion of Technology Development.

Milestone B - Program initiation documents are listed in Table A and Table B.

THE LIFE CYCLE MODEL – 3RD PHASE



Purpose or scope:
•Develop a system;
•Reduce integration and manufacturing risk;
•Ensure operational supportability;
•Design for producibility;
•Ensure affordability and the protection of Critical Program Information (CPI);
•Demonstrate system integration, interoperability, and utility.

Major activities:
•Components are integrated into a system
•The system meets its operational requirements (demonstrated by testing and modeling and simulation).
•Logistics and production planning are completed.

DRR – Design Readiness Review

The **purpose** of the System Development and Demonstration phase is to develop a system; reduce integration and manufacturing risk (technical risk reduction occurs during Concept Refinement and Technology Development); ensure operational supportability with particular attention to reducing the logistics footprint and providing for human systems integration (working with the personnel, training, environmental, safety, health, and manpower communities); design for producibility; ensure affordability and the protection of Critical Program Information (CPI); and demonstrate system integration, interoperability, and utility. Discovery and development are aided by using simulation-based acquisition and test and evaluation. Simulation-based acquisition and test and evaluation are integrated into an efficient continuum and are guided by a system acquisition strategy and test and evaluation master plan (TEMP). Independently planning, executing, and evaluating Initial Operational Test and Evaluation (IOT&E) and Follow-on Operational Test and Evaluation (FOT&E), if required, is the responsibility of the Army Test and Evaluation Command (ATEC). The Director, Operational Test & Evaluation (DOT&E) approves the live-fire test and evaluation (LFT&E) strategy.

System Development and Demonstration has two major efforts: System Integration and System Demonstration. The entrance point is Milestone B, which is also the initiation of an acquisition program. There is only one Milestone B per program or evolutionary increment. Table A and Table B contains the statutory and regulatory requirements that must be met at Milestone B.

Entrance Criteria - Entering this phase depends on technology maturity (including software), validated requirements, and funding. Unless some other factor is overriding in its impact, the technology maturity determines the path to be followed. Programs that enter the acquisition process at Milestone B shall have an integrated architecture for their relevant mission area.

Before proposing a new acquisition program, DoD Components shall affirmatively answer the following questions:

1. Does the acquisition support core or priority mission functions that need to be performed by the Federal Government?
2. Does the acquisition need to be undertaken by the Army because no alternative private sector or governmental source can better support the function?
3. Does the acquisition support work processes that have been simplified or redesigned to reduce costs, improve effectiveness, and make maximum use of commercial off-the-shelf technology?

Managing and reducing technological risk means less costly and less time-consuming systems development. It is a crucial part of overall program management and is especially relevant to meeting cost and schedule goals. Objectively assessing technology maturity and risk is a continuous aspect of Defense acquisition. Technology can be developed in a Government laboratory, by industry or a university. Regardless of its source, technology must be demonstrated (preferably, in an operational environment) before it can be considered mature enough to use in an acquisition program. Technology maturity assessments and, occasionally, independent assessments are conducted. If technology is not mature, the Army must use an alternative technology that is mature and that can meet the user's needs.

Prior to beginning System Development and Demonstration, users must identify and the requirements authority validates a minimum set of key performance parameters (KPP), included in the CDD, that guide the efforts of this phase. These key performance parameters may be refined as conditions warrant. Each set of key performance parameters only apply to the current increment of capability in development and demonstration (or, in a single step to full capability, to the entire system). At Milestone B, the program manager prepares and the MDA approves an acquisition strategy that specifies the approach the program will use to achieve the required capability. Each program has an Acquisition Program Baseline (APB) establishing program goals--thresholds and objectives--for the minimum number of cost, schedule, and performance parameters that describe the program over its life cycle.

A Milestone B approval signifies **program initiation**.

An affordability determination is included in each CDD, using life-cycle cost or, if available, total ownership cost. Transitioning into System Development and Demonstration also requires full funding (i.e., including dollars and manpower needed for

all current and future efforts to carry out the acquisition strategy in the budget and out-year program), which shall be programmed when a system concept and design have been selected, a program manager (PM) has been assigned, requirements have been approved, and system-level development is ready to begin.

System Integration - This sub phase is intended to integrate subsystems and reduce system-level risk. The program enters System Integration when the PM has a technical solution for the system, but has not yet integrated the subsystems into a complete system. Validated key performance parameters guide this work effort. This sub phase typically includes demonstrating prototype articles. A system development contract is the most common means of integrating components and technologies into a full system.

The **Design Readiness Review** conducted during System Development and Demonstration provides an opportunity for a mid-phase assessment of design maturity as evidenced by such measures as:

- The number of completed subsystem and system design reviews;
- The percentage of drawings completed;
- Adequacy of development testing;
- A completed failure modes and effects analysis;
- Identifying key system characteristics and critical manufacturing processes;
- And the availability of reliability targets and a growth plan;

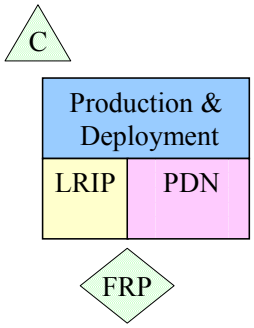
Successfully completing the Design Readiness Review ends System Integration and begins the System Demonstration work effort.

System Demonstration - This effort is intended to demonstrate the ability of the system to achieve the validated key performance parameters. The program enters System Demonstration when the program manager has demonstrated the system in prototypes. System Demonstration ends when a system:

- Is demonstrated in its intended environment, using engineering development models or integrated commercial items;
- Meets validated requirements;
- Industrial capabilities are reasonably available;
- And the system meets or exceeds exit criteria and Milestone C entrance requirements.

A successful development test and evaluation, early operational assessments, and, where proven capabilities exist, using modeling and simulation to demonstrate system integration are critical during this work effort. Completing this phase is dependent on a decision by the milestone decision authority to commit to the program at Milestone C or a decision to terminate the program.

THE LIFE CYCLE MODEL – 4TH PHASE



Purpose or scope:
•Achieve an operational capability that satisfies mission needs

Major activities:
•Award LRIP contract
•Award full-rate production contract
•Deploy the systems

FRP – Full-rate production decision review

The **purpose** of the Production and Deployment phase is to achieve an operational capability that satisfies mission needs. Operational test and evaluation will determine the effectiveness, suitability, and survivability of the system. The milestone decision authority makes the decision to commit the DoD to production at Milestone C.

Milestone C authorizes

- Low-Rate Initial Production (LRIP) for major systems;
- Production or procurement for non-major systems that do not require LRIP;
- Or limited deployment for major automated information system (MAIS) programs or software-intensive systems with no production components.

Table A and Table B contain the statutory and regulatory requirements that must be met at Milestone C.

For major programs, Production and Deployment has two major efforts: LRIP and Full-Rate Production with Deployment, and includes a Full-Rate Production Decision Review (FRP).

Entering into the Production and Deployment Phase depends on the following criteria:

- Acceptable performance in development, test and evaluation and operational assessment;
- Mature software capability;
- No significant manufacturing risks;
- A manufacturing process in control (if Milestone C is full-rate production);
- An approved Capability Production Document (CPD);
- Acceptable interoperability;
- Acceptable operational supportability;
- Compliance with the DoD Strategic Plan;

- And demonstration that the system is affordable throughout the life cycle, optimally funded, and properly phased for rapid acquisition.

If Milestone C approves LRIP, a subsequent review and decision will authorize full-rate production.

Low-rate initial production (LRIP) is intended to result in completing manufacturing development in order to ensure adequate and efficient manufacturing capability and to produce the minimum quantity necessary to provide production configured or representative articles for Initial Operational Test and Evaluation (IOT&E), establish an initial production base for the system; and permit an orderly increase in the production rate for the system, sufficient to lead to full-rate production upon successfully completing operational (and live-fire, where applicable) testing.

The Director of Operational Test and Evaluation (DOT&E) must give prior written approval of the test plans (including the projected level of funding) for operational tests and evaluation being conducted on a major system. After approval, the Army may conduct its operational testing. The DOT&E determines the number of LRIP articles required for Live-Fire Test and Evaluation (LFT&E) and IOT&E.

Deficiencies encountered in testing prior to Milestone C shall be resolved before proceeding beyond LRIP (at the Full-Rate Production Decision Review) and any fixes verified in IOT&E.

LRIP may be funded by the research, development, test and evaluation (RDT&E) appropriation or by procurement appropriations, depending on the intended use of the LRIP assets. E.g., if an end item is being deployed to a field unit, its production is funded by procurement appropriations.

LRIP quantities are minimized. The milestone decision authority determines the LRIP quantity for major systems at Milestone B. The LRIP quantity (with rationale for quantities exceeding 10 percent of the total production quantity documented in the acquisition strategy) is included in the first Selected Acquisition Report (SAR) after its determination. The milestone decision authority must approve any increase in LRIP quantity.

LRIP is not applicable to automated information systems or software intensive systems with no developmental hardware. However, a limited deployment phase may be applicable. Software shall have proven its maturity level prior to deploying it to the operational environment. Once maturity has been proven, the system or increment is baselined, and a methodical and synchronized deployment plan is implemented for all applicable locations.

Full-Rate Production Criteria – a major system may not proceed beyond low-rate initial production without approval of the milestone decision authority. The available knowledge to support this approval shall include demonstrated control of the

manufacturing process and reliability, the collection of statistical process control data, and the demonstrated control and capability of other critical processes. The decision to continue beyond low-rate to full rate production requires that IOT&E be completed.

Full-rate Production Decision (FRP) - Continuation into full rate production results from a successful Full-Rate Production Decision Review by the milestone decision authority (or person designated by the MDA). Full-rate production delivers the fully funded quantity of systems and supporting materiel and services to the users.

Table A and Table B contains the statutory and regulatory requirements that must be met at the full-rate production decision.

Full-rate Production – may be defined as producing quantities of an item after completing production trials and tests. Examples of these assessments include low-rate initial production, production qualification test, first article test, and physical configuration audit. The term, full-rate production, includes a quantity ranging from mass producing items at the manufacturer's highest capacity to producing one or two items per month. Full-rate production is governed by a combination of: product complexity, manufacturing capacity, configuration control, quantity desired, funding availability and political considerations.

The Army establishes the First Unit Equipped Date (FUED) during the Technology Development Phase. The combat developer chooses the unit size. It may be a battalion, squadron, company, or battery. The items furnished can either come from low rate initial production or full-rate production sources.

After achieving the first unit equipped date, units must then attain their Initial Operational Capability (IOC) date.

THE LIFE CYCLE MODEL – 5TH PHASE

Operations & Support
Sustainment

Scope or purpose:
•Executing a support program that meets operational support performance requirements and sustainment of systems in the most cost-effective manner for the life cycle of the system.
•Disposing of the system when it has reached the end of its useful life.

Major activities:
•Continue purchasing and deploying support items for sustainment
•Continue exercising configuration management functions.
•Schedule and perform depot maintenance.
•Apply system upgrades
•Send obsolete systems to disposal.

The objectives of this activity are the execution of a support program that meets operational support performance requirements and sustainment of systems in the most cost-effective manner for the life cycle of the system. When the system has reached the end of its useful life, it must be disposed of in an appropriate manner. Operations and Support has two major efforts: Sustainment and Disposal.

Sustainment - includes supply, maintenance, transportation, sustaining engineering, data management, configuration management, manpower, personnel, training, habitability, survivability, environmental management, safety (including explosives safety), occupational health, protection of Critical program information (CPI), anti-tamper provisions, information technology (IT), including National Security Systems (NSS), supportability and interoperability, and environmental management functions. Effective sustainment of weapon systems begins with designing and developing a reliable and maintainable system through continually applying a systems engineering methodology.

Effectively sustaining weapon systems begins with the design and development of reliable and maintainable systems through the continuous application of a robust systems engineering methodology. As a part of this process, the program manager uses human factors engineering to design systems that require minimal manpower; provide effective training; use representative personnel; and are suitable (habitable and safe with minimal

environmental and health hazards) and survivable (for both the crew and equipment). For business area capabilities, the program manager uses commercially available solutions.

Actions required:

- The program manager works with the users to document performance and support requirements in performance agreements specifying objective outcomes, measures, resource commitments, and stakeholder responsibilities. The Military Services document sustainment procedures that ensure integrated combat support.
- The Army initiates system modifications to improve performance and reduce ownership costs.
- Program managers optimize operational readiness through embedded diagnostics and prognostics, serialized item management, automatic identification technology (AIT), and iterative technology refreshment.
- Program managers ensure that data syntax and semantics for high capacity automated identification technology (AIT) devices conform to ISO 15434 and ISO 15418.
- The Army will conduct continuing reviews of sustainment strategies, using comparisons of performance expectation as defined in performance agreements against actual performance measures. Program managers will revise, correct, and improve sustainment strategies to meet performance requirements.

Disposal - At the end of its useful life, a system must be demilitarized and disposed in accordance with legal and regulatory requirements and policy relating to safety (including explosives safety), security, and the environment. During the design process, program managers will document hazardous materials used in the system, and plan for the system's demilitarization and disposal.

Summary

This reading was created to give you an introduction to the system acquisition process. The Army Acquisition Basic Course curriculum is designed around this complicated process. Each subsequent instructional unit will provide additional details about the Army's acquisition process.

Review Questions

1. Describe the environment surrounding system acquisition. (Answer)
2. Name the six basic activities in system acquisition. (Answer)
3. Name the non-materiel alternatives. (Answer)
4. Describe the milestone decision review. (Answer)
5. Name the five DoD life cycle phases. (Answer)
6. Recall the scope or purpose of each life cycle phase.
    a. Concept Refinement (Answer)
    b. Technology Development (Answer)
    c. System Development and Demonstration (Answer)
    d. Production and Deployment (Answer)
    e. Operations and Support (Answer)
7. Describe risk. (Answer)
8. List three broad categories of technological maturity. (Answer)
9. During what life cycle phases is it appropriate to insert mature technology? (Answer)
10. What are, "cooperative opportunities" as related to the research and development process? (Answer)
11. What is another name given to the DoD Strategic Plan? (Answer)
12. What does it mean to have a "baseline?" (Answer)
13. Define:
    a. Systems acquisition process. (Answer)
    b. Milestone decision authority (Answer)
    c. Acquisition Decision Memorandum (ADM) (Answer)
    d. Exit criteria (Answer)
    e. Acquisition Program Baseline (APB) (Answer)
    f. Analysis of Alternatives (AoA) (Answer)
    g. Capabilities Development Document (CDD) (Answer)
    h. Key performance parameter (KPP) (Answer)
    i. Critical program information (CPI) (Answer)
    j. Acquisition strategy (Answer)
    k. Modeling and simulation (M&S) (Answer)
    l. Test and Evaluation Master Plan (TEMP) (Answer)
    m. Initial Operational Test and Evaluation (IOT&E) (Answer)
    n. Live Fire Test and Evaluation (LFT&E) (Answer)
    o. Capabilities Production Document (CPD) (Answer)
    p. Design Readiness Review (Answer)
    q. Dual use technology (Answer)
    r. Commercial off the shelf (COTS) (Answer)
    s. Initial operational capability (IOC) (Answer)
    t. Interoperability (Answer)
    u. Low rate initial production (LRIP) (Answer)

Acquisition Policies

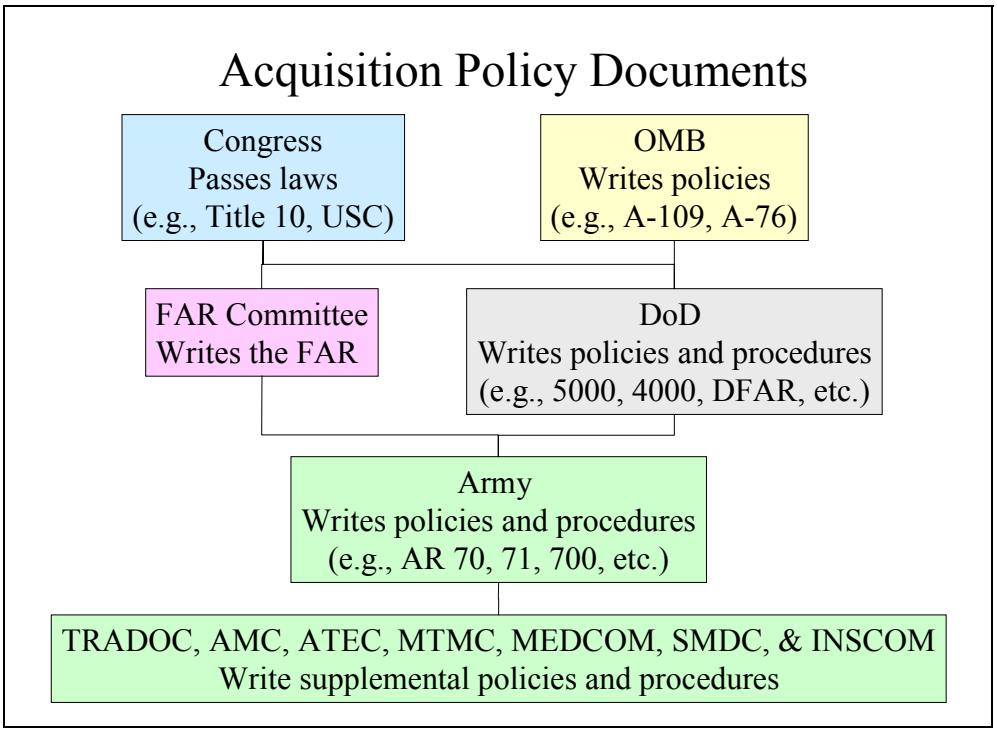
Principal References	
AR 381-11	Threat Support
AR 602-2	Manpower and Personnel Integration (MANPRINT) in the System Acquisition Process
AR 700-127	Integrated Logistics Support
AR 70-1	Army Acquisition Policy
AR 73-1	Materiel Testing
CJCSI 3170.01	Joint Capabilities Integration & Development
DA PAM 70-3	Army Acquisition Procedures
DFAR	Defense Federal Acquisition Regulations
DoDD 5000.1	Defense Acquisition
DoDI 5000.2	Operation of the Defense Acquisition System
FAR	Federal Acquisition Regulation
MIL-HDBK 502	Acquisition Logistics
MIL-HDBK 881	Work Breakdown Structure
OMB Circular A-109	Major System Acquisitions
TRADOC PAM 71-9	Requirements Determination

As noted by the partial list above, we have a large number of acquisition policies that guide military weapon system acquisition programs. Acquisition policies are the "building blocks" of the life cycle model. That is, each acquisition policy may establish a single event in the DoD life cycle process. As a result, if you want to change the life cycle model, then change acquisition policies. Acquisition policies are created to:

- Assist the acquisition workforce acquire systems that meet cost, schedule and performance requirements.
- Ensure the program meets its legal requirements.
- Provide management with tools to assess progress.

The following chart shows a hierarchy of acquisition policies. For example, Congress passes laws that may change our procurement rules or the acquisition process. If a law affects the procurement process, the Federal Acquisition Regulation Committee will meet and change the FAR to implement the new Federal law. If a new law affects the acquisition process, the DoD will change its DoD policies to implement the new Federal law. As a result, the Army may need to change its acquisition policies to implement the revised DoD policy and the Army Materiel Command (for example) may need to change its acquisition procedures to implement the revised Army regulation.

It is important to note that as an organization changes its acquisition policies, it causes a ripple effect throughout lower-level acquisition organizations. Based on experience, it takes the lowest levels of the acquisition hierarchy up to three years to fully implement some of the changes made by the highest-level organizations.



Abbreviations used in this chart are:

AMC	Army Materiel Command	MEDCOM	Medical Command
AR	Army Regulation	MTMC	Military Transportation and Management Command
ATEC	Army Test and Evaluation Command	OMB	Office of Management and Budget
DoD	Department of Defense	SMDC	Space and Missile Defense Command
FAR	Federal Acquisition Regulation	TRADOC	Training and Doctrine Command
INSCOM	Intelligence and Security Command	USC	United States Code (Federal law)

Numerous efforts have been made over the years to reduce the number of acquisition policies. Apparently, there are two forces that counteract policy reduction efforts.

1) The bureaucracy. Many military and civilian members of the acquisition workforce enjoy having a full set of policies and procedures to follow. This helps them avoid overlooking important events during system acquisition. It also provides invaluable guidance to less experienced acquisition members.

2) An attempt to avoid making the same mistakes twice. If a program manager or other acquisition employee makes a serious mistake, we have a tendency to write an acquisition policy designed to prevent anyone else from making that mistake on subsequent acquisition programs. Even Congress will sometimes pass laws to ensure that the DoD Components avoid repeating mistakes.

Regardless of the ongoing efforts to achieve a balance between reducing restrictive policies and providing adequate guidance, you must learn acquisition policies in order to understand the life cycle model.

"Most of the things that are difficult in a bureaucracy are the result of laws that Congress passed." -- Mark Calabria, a former Senate staffer.

Risk

Risk is a measure of the potential inability to achieve overall program objectives within defined cost, schedule, and technical constraints and has two components: (1) the probability or likelihood of failing to achieve a particular outcome, and (2) the consequences or impacts of failing to achieve that outcome.

There is no one best way to structure an acquisition program so that it accomplishes the objectives of the Defense Acquisition System. Decision-makers and program managers tailor acquisition strategies to fit the particular conditions of an individual program, consistent with common sense, sound business management practice, applicable laws and regulations, and the time-sensitive nature of the user's requirement. Proposed programs may enter the acquisition process at various decision points, depending on concept and technology maturity. Tailoring is applied to various aspects of the acquisition system, including program documentation, acquisition phases, the timing and scope of decision reviews, and decision levels. Milestone decision authorities promote flexible, tailored approaches to oversight and reviews are based on mutual trust and a program's dollar value, risk, and complexity.

The acquisition strategy addresses risk management. The PM identifies the risk areas of the program and integrates risk management within overall program management. The strategy explains how the risk management effort reduces system-level risk to acceptable levels by the interim progress review preceding system demonstration and by Milestone C.

Program managers plan and budget for effective modeling and simulation to reduce the time, resources, and risk associated with the entire acquisition process; increase the quality, military worth and supportability of fielded systems; and reduce total ownership costs throughout the system life cycle.

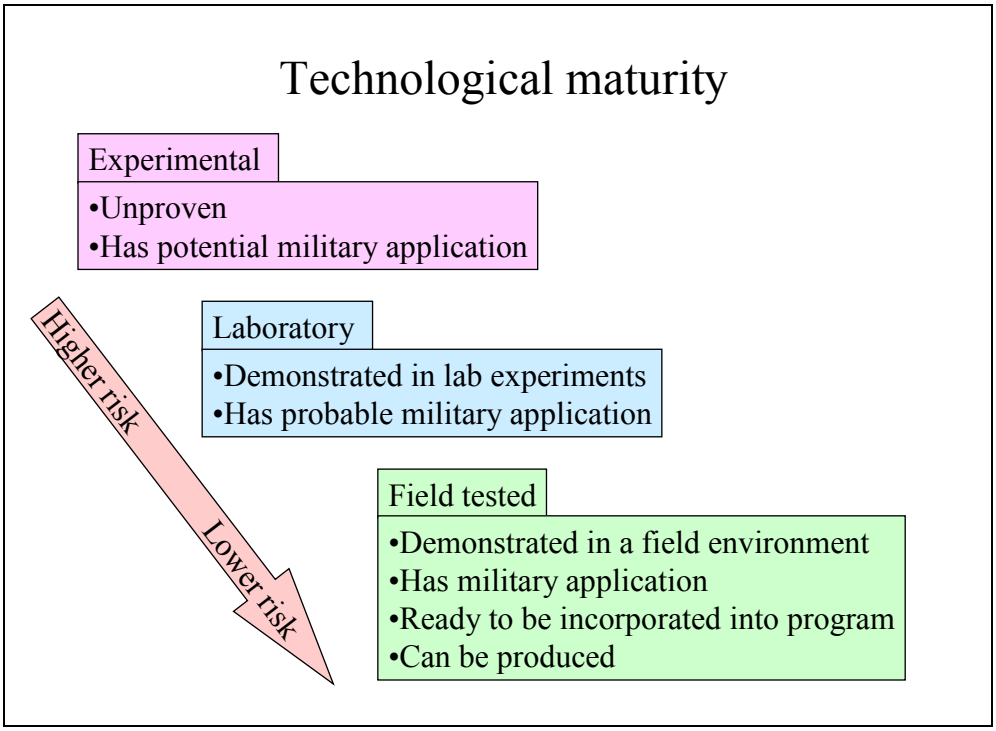
For software intensive systems and information systems, test and evaluation of software must be accomplished as part of the overall system development and test program. This test and evaluation must provide an acceptable level of risk that system requirements and mission objectives will not be impaired by deficiencies attributable to software. Test and evaluation of the software reflects a systematic and measurable process. Clearly defined risk assessment criteria for each phase, metrics, and continuous evaluations form the basis for a logical progression of the test and evaluation which supports software development. Due to the inherent incremental nature of software development, incremental test and evaluation of the software, in which the software is divided into incremental blocks for development, testing, and fielding, may be appropriate.

The Army is moving today to build a force capable and prepared to meet impending challenges. To meet these challenges, we have implemented Acquisition Reform as the process to efficiently modernize our force. An integral part of this new process is modeling and simulation. When modeling and simulation is included in our acquisition strategy, we can identify issues early and achieve benefits such as reduced cost, risk, and time to make informed milestone decisions. Modeling and simulation can support acquisition from concept to fielding through such innovations as: virtual prototyping; engineering design simulation; testing and evaluation; virtual factory development; system and force effectiveness; and training simulation.

The acquisition process is designed to provide a needed capability to the warfighter in the shortest practical time and concurrently reducing risk, ensuring affordability, and providing adequate information for decision-making.

Managing and mitigating technological risk, which allows less costly and less time-consuming systems development, is a crucial part of overall program management and is especially relevant to meeting cost and schedule goals. Objectively assessing technology maturity and risk is a continuous aspect of Defense acquisition. In general, technology developed in defense research facilities, procured from industry or from other sources should be demonstrated in an operational environment before using it in product development in systems integration. If the technology is not mature, the DoD Component shall use alternative technology that is mature and that can meet the user's needs.

The chart below shows three broad groupings of technology and associated risk as related to the life cycle model.



The following chart shows the nine technology readiness levels and their description. These technology readiness levels can serve as a guide to a program's status.

Technology Readiness Level	Description
1. Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into technology's basic properties.
2. Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. The application is speculative and there is no proof or detailed analysis to support the assumption. Examples are still limited to paper studies.
3. Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
4. Component and/or breadboard validation in laboratory environment.	Basic technological components are integrated to establish that the pieces will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in a laboratory.
5. Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so that the technology can be tested in simulated environment. Examples include "high fidelity" laboratory integration of components.
6. System/subsystem model or prototype demonstration in a relevant environment.	Representative model or prototype system, which is well beyond the breadboard tested for level 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high fidelity laboratory environment or in simulated operational environment.
7. System prototype demonstration in an operational environment.	Prototype near or at planned operational system. Represents a major step up from level 6, requiring the demonstration of an actual system prototype in an operational environment. Examples include testing the prototype in a test bed aircraft.
8. Actual system completed and qualified through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this level represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.
9. Actual system proven through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. Examples include using the system under operational mission conditions.

Table A – Required Documents

Information Required	When Required
Consideration of Technology Issues	Milestone (MS) A MS B MS C
Market Research	Technology Opportunities User Needs MS A MS B
Acquisition Program Baseline (APB)	MS B MS C (updated, as necessary) Full-Rate Production DR
Program Deviation Report	Immediately upon a program deviation
Compliance with Strategic Plan (as part of the analysis of alternatives, whenever practical)	MS B MS C
Selected Acquisition Report (SAR)—DD-AT&L (Q&A) 823 (MDAPs only)	MS B and annually thereafter End of quarter following o MS C o Full-Rate Production DR o Breach
Unit Cost Report (UCR)— DD-AT&L (Q&R)1591 (MDAPs only)	Quarterly
Live Fire Waiver & alternate LFT&E Plan (Covered Systems only)	MS B
Industrial Capabilities (part of acquisition strategy) (N/A for AISs)	MS B MS C
LRIP Quantities (N/A for AISs)	MS B
Independent Cost Estimate (CAIG) and Manpower Estimate (reviewed by OUSD (P&R)) (N/A for AISs) (MDAPs Only)	MS B MS C Full-Rate Production DR
Operational Test Plan (DOT&E Oversight Programs only)	Prior to start of operational test and evaluation
Cooperative Opportunities (part of acquisition strategy)	MS B MS C
Post-Deployment Performance Review	Full-Rate Production DR
Beyond-LRIP Report (OSD OT&E Oversight programs only)	Full-Rate Production DR
LFT&E Report, RCS DD-OT&E(AR)1845 (LFT&E-covered programs only)	Full-Rate Production DR

Electronic Warfare (EW) T&E Report, Report Control Symbol (RCS) DD-AT&L(A)2137 (EW programs on OSD T&E Oversight List)	Annually
CCA Compliance (All IT–including NSS)	MS B MS C Full-Rate Production DR
Registration of mission-critical and mission-essential information systems, RCS DD-C3I (AR)2096	MS B (if Program Initiation) MS C (if Program Initiation)
Spectrum Certification Compliance (DD Form 1494) (applicable to all systems or equipment that require usage of the electromagnetic spectrum)	MS B MS C (if no MS B)
Programmatic Environmental Safety and Health Evaluation (Including National Environmental Policy Act Schedule)	MS B MS C Full-Rate Production DR
Core Logistics Analysis and Source of Repair Analysis (part of acquisition strategy)	MS B MS C (if no MS B)
Competition Analysis (Depot-level Maintenance $3M rule) (part of acquisition strategy)	MS B MS C (if no MS B)

Table B – Regulatory Information Requirements

Information Required	When Required
Validated ICD – Validated CDD – Validated CPD –	MS A MS B MS C
Acquisition Strategy	MS B MS C Full-Rate Production DR
Analysis of Multiple Concepts	MS A
Analysis of Alternatives (AoA)	MS B MS C (if no MS B)
System Threat Assessment Report (STAR) (AIS programs use published Capstone Information Operations System Threat Assessment) (validated by DIA for ACAT ID programs)	MS B MS C
Technology Readiness Assessment	MS B MS C
Independent Technology Assessment (ACAT ID only) (if required by DUSD (S&T))	MS B MS C
C4ISP (also summarized in the acquisition strategy)	MS B MS C
C4I Supportability Certification	Full-Rate Production DR

Interoperability Certification	Full-Rate Production DR
Affordability Assessment	MS B MS C
Economic Analysis (MAISs only)	MS B
Component Cost Analysis (mandatory for MAIS; as requested by CAE for MDAP)	MS B (for MAIS, each time the MDA requests an Economic Analysis) Full-Rate Production DR (MDAPs only)
Cost Analysis Requirements Description (MDAPs and MAIS Acquisition Programs only)	MS B MS C Full-Rate Production DR
Test and Evaluation Master Plan (TEMP)	MS A (evaluation strategy only) (w/in 180 days after MS A approval) MS B MS C (update, if necessary) Full-Rate Production DR
Operational Test Activity Report of Operational Test and Evaluation Results	MS B MS C Full-Rate Production DR
Component Live Fire Test and Evaluation Report (Covered Systems Only)	Completion of Live Fire Test and Evaluation
Program Protection Plan (PPP) (for programs with critical program information) (also summarized in the acquisition strategy)	MS B (based on validated requirements in CPD) MS C
Exit Criteria	MS A MS B MS C Each Review
Defense Acquisition Executive Summary (DAES), DD-AT&L (Q) 1429	Quarterly Upon POM or BES submission Upon unit cost breach
Acquisition Decision Memorandum (ADM)	MS A MS B MS C Each Review

Definitions

Acquisition Category IAM (ACAT IAM)	A major automated information system (MAIS) acquisition program for which the MDA is the Chief Information Officer (CIO) of the Department of Defense (DOD), the ASD (C3I). *CJCSI 3170.01B*
Acquisition Category IC (ACAT IC)	ACAT IC programs, delegated to the Army, are Major Defense Acquisition Programs (MDAP) for which the MDA has been designated as the AAE. These programs receive an Army Systems Acquisition Review Council (ASARC) review and require a decision by the AAE at each milestone review. *AR 70-1*
Acquisition Category ID (ACAT ID)	A major defense acquisition program (MDAP) for which the MDA is USD (AT&L). The "D" refers to the Defense Acquisition Board (DAB), which advises the USD (AT&L) at major decision points. *CJCSI 3170.01B*
Acquisition Category II (ACAT II)	ACAT II programs are acquisition programs that do not meet the criteria for an ACAT I program, but do meet the criteria for a major system. These programs are managed by a PM who reports to a PEO or a materiel command as designated by the AAE. These programs receive an Army Systems Acquisition Review Council (ASARC) review and require a decision by the AAE at each milestone review. *AR 70-1*
Acquisition Decision Memorandum (ADM)	The USD (AT&L) decides on the appropriate implementing actions to be taken as a result of DAB reviews, to include establishing specific exit criteria that must be satisfactorily demonstrated before an effort or program can progress to the next milestone decision point. The USD (AT&L)'s decisions are reflected in an Acquisition Decision Memorandum issued by the USD (AT&L) for implementation by the heads of the DoD Components. *DoDD 5134.1*
Acquisition Program Baseline (APB)	Each baseline is developed and updated by the program manager and will govern the activity in the phase succeeding the milestone for which it was developed. The Concept Baseline, Development Baseline, and Production Baseline are prepared at Milestone I, II, and III, respectively. APBs consist of three parts; section A -- performance (contains KPP), section B -- schedule, and section C -- cost. Every acquisition program establishes an Acquisition Program Baseline (APB) to document the cost, schedule, and performance objectives and thresholds of that program beginning at program initiation. Performance shall include supportability and, as applicable, environmental

	requirements. For Acquisition Category (ACAT) I programs, the APB implements the requirement in law beginning at Milestone B. The format for the APB is included in the Consolidated Acquisition Reporting System (CARS). *DoD 5000.2-R*
Acquisition Strategy	The acquisition strategy shall include the critical events that shall govern the management of the program. The event-driven acquisition strategy shall explicitly link program decisions to demonstrated accomplishments in development, testing, initial production, and life-cycle support. The events set forth in contracts shall support the appropriate exit criteria for the phase, or intermediate development events, established for the acquisition strategy. The program acquisition strategy shall analyze the industrial capability to design, develop, produce, support and, if appropriate, restart the program. All acquisition programs shall foster competition at subcontractor levels, as well as at the prime level, particularly in critical product and technology areas. To accomplish this, the PM shall focus on critical product and technology competition when: a) formulating the acquisition strategy; b) exchanging information with industry; and c) managing the program system engineering and life cycle. The acquisition strategy shall be based, in part, on an analysis of product and technology areas critical to meeting the program's needs. The acquisition strategy shall identify the potential industry sources available to supply these critical products and technologies. The acquisition strategy shall highlight areas of potential vertical integration, that is, areas where potential prime contractors are also potential suppliers for critical products and technologies. Vertical integration may be detrimental to DoD interests if a firm employs internal capabilities without consideration of, or in spite of the superiority of, the capabilities of outside sources. The acquisition strategy shall describe the approaches the PM will use (e.g., requiring an open systems architecture, investing in alternate technology or product solutions, breaking out a subsystem or component, etc.) to establish or maintain access to competitive suppliers for critical areas at the system, subsystem, and component levels.

	The PM shall consider the use of leasing in the acquisition of commercial vehicles and equipment whenever the PM determines that leasing of such vehicles is practicable and efficient. The PM shall not enter into any lease with a term of 18 months or more, or extend or renew any lease for a term of 18 months or more, for any vessel, aircraft, or vehicle, unless the PM has considered all costs of such a lease (including estimated termination liability) and has determined in writing that the lease is in the best interest of the Government. The acquisition strategy shall be tailored to meet the specific needs of individual programs, including consideration of incremental (block) development and fielding strategies. The benefits and risks associated with reducing lead-time through concurrency shall be specifically addressed in tailoring the acquisition strategy. In tailoring an acquisition strategy, the PM shall address the management requirements imposed on the contractor(s) (CCA). The PM shall initially develop the acquisition strategy at program initiation (usually Milestone B), and shall keep the strategy current by updating it whenever there is a change to the approved acquisition strategy or as the system approach and program elements are better defined. The PM shall develop the acquisition strategy in coordination with the Working-level Integrated Product Team. The PEO and CAE, as appropriate, shall concur in the acquisition strategy. The MDA shall approve the acquisition strategy prior to release of the formal solicitation. This approval shall usually precede the milestone review, except at program initiation when the strategy shall usually be approved as part of the initial milestone decision review. DoD 5000.2-R
Analysis of Alternatives (AoA)	The evaluation of the operational effectiveness and estimated costs of alternative material systems to meet a mission need. The analysis assesses the advantages and disadvantages of alternatives being considered to satisfy requirements, to include the sensitivity of each alternative to possible changes in key assumptions or variables. The AoA assists decision makers in selecting the most cost-effective material alternative to satisfy a mission need. *CJCSI 3170.01B*

Army Acquisition Career Program Board (AACPB)	The Army Acquisition Career Program Board advises the AAE on managing the accession, training, education, retention and career development of military and civilian personnel in the acquisition workforce, on the selection of individuals for the Acquisition Corps, on the rotational review of occupants of Critical Acquisition Positions (CAP) after five years assigned to a position, and on the need to waive requirements permitted by law or regulation. The Board is chartered by the Secretary of the Army, pursuant to the authority of Sections 1202 and 1706 of the Defense Acquisition Workforce Improvement Act (Title XII of the National Defense Authorization Act for Fiscal Year 1991). AR 70-1
Army Enterprise Architecture (AEA)	An integrated plan of action for accomplishing Army-wide information technology and investment strategies to accomplish the Joint Vision and the Army Vision 2010. It documents the total AEA and specifies the information systems programs and resource requirements necessary to support stated sessions and objectives. AR 5-11 The Vision - seamless information architecture from the sustaining base to the foxhole. A single, unified vision for the C4I community that addresses: ▪ Information needs ▪ Requirements to organize, train, and equip ▪ Requirements as a component of a joint and combined force ▪ Requirements to sustain the force. ▪ The Army Enterprise Strategy is the single, unified vision for the ARMY C4I community and is presented in "The Army Enterprise Vision" document. ▪ The Army Enterprise Architecture (AEA) is described by three related architectures: ▪ Operational Architecture (OA) - is the total aggregation of missions, functions, tasks, information requirements, and business rules. Technical Architecture (TA) - is the "building code" upon which systems are based. Systems Architecture (SA) - is the physical implementation of the OA based on the TA, and also the layout and relationship of systems and communications. Army Enterprise Architecture (AEA): The Army Enterprise Architecture fulfills the 1996 Clinger-Cohen Act requirement to develop an enterprise-wide information technology (IT) architecture. The AEA is an

	Army-wide IT architecture that describes the relationships among key Army institutional processes and IT to ensure the alignment of information systems acquisition and related processes with validated warfighting operational and support requirements. It also ensures adequate Army, joint, and combined interoperability; redundancy and security of information systems; and the application and maintenance of a set of standards (including technical standards) by which the Army evaluates and acquires new systems. The AEA is both a tool and a set of products. The AEA is a tool to describe the Army's IT requirements and capabilities. As a tool the AEA directs the development, management, and use of architecture and supporting architecture products through such means as the AEA Guidance Document (AEAGD). In addition, the AEA includes a recapitulation of applicable architecture policy and a set of architecture development and management tools. As a set of products, the AEA is the validated description of the Army's IT requirements, existing capabilities, projected needs, and prescribed IT standards based on a consistent methodology. It is important to note that the AEA is not an entity unto itself. It derives from the Army Enterprise Strategy and the Army Enterprise Implementation Plan, which were signed out at the highest levels in the Army in 1993 and 1994. These efforts gained additional impetus from Joint Vision 2010 and Army Vision 2010 and from the Clinger-Cohen Act of 1996. The AEA continues to evolve in concert with The Army Plan, Army Strategic Planning Guidance, and the Army Digitization Office's Army Digitization Master Plan. The Army Enterprise Strategy Control Structure exercises control over the AEA. AEA Master Plan that includes the Strategic Plan and a Program Plan Army Enterprise Architecture Guidance Document (AEAGD) - Supplements DOD's C4ISR Architecture Framework and provides guidance on AEA Architecture Products.
Army Systems Acquisition Review Council (ASARC)	Top level DA review body for ACAT I and ACAT II programs. Convened at formal milestone reviews or other program reviews to provide information and develop recommendations for decision by the AAE. *AR 71-9*
Baseline	A baseline is a record, or "snapshot" taken at a specific time in the project. A baseline is useful for comparing

	your current schedule with later versions of the schedule to see what changes have occurred.
Basis of Issue Plan (BOIP)	Document that establishes the distribution of new equipment and associated support items of equipment and personnel, as well as the reciprocal displacement of equipment and personnel. Prepared by the combat developer and approved by the Deputy Chief of Staff for Plans and Operations (DCSOPS).
Capability Development Document (CDD)	A formatted statement containing performance and related operational parameters for the proposed concept or system. Prepared by the user or user's representative at each milestone beginning with Milestone B.
Capability Production Document (CPD)	A final version of the CDD which describes the ultimate capabilities required of the system. It describes the functions of the item to be produced.
Capstone Requirements Document (CRD)	A document that contains capabilities-based requirements that facilitates developing an individual ORD by providing a common framework and operational concept to guide their development. It is an oversight tool for overarching requirements for a system-of-systems or family-of-systems. *CJCSI 3170.01A*
Clothing and Individual Equipment (CIE)	A collective term that includes personal clothing, optional clothing, organizational clothing, and individual equipment that is not an integral part of the design and operation of major equipment.
Combat developer (CBTDEV)	Command or agency that formulates and documents operational concepts, doctrine, organizations, and or materiel requirements (MNS and ORD) for assigned mission areas and functions. Serves as the user representative during acquisitions for their approved materiel requirements as well as doctrine and organization developments. *AR 71-9* ▪ TRADOC is the Army's largest combat developer. ▪ Medical Command (MEDCOM), Space and Missile Defense Command (SMDC), and Intelligence and Security Command (INSCOM) are other combat developers.
Commercial Off-The-Shelf (COTS)	Commercial items that require no unique government modifications or maintenance over the life cycle of the product to meet the needs of the procuring agency.
Configuration management (CM)	Is the process of managing the technical configuration of items being developed whose requirements are specified and tracked. Configuration items are designated in the work breakdown structure, which may need to be extended beyond the third level to clearly define all elements subject to configuration management.

	Configuration management involves defining the baseline configuration for the configuration items, controlling the changes to that baseline, and accounting for all approved changes. In establishing the requirement for configuration management on a program, the program manager needs to designate which contract deliverables are subject to configuration management controls. A contract deliverable designated for configuration management is called a Configuration Item. For software, this item is called a Computer Software Configuration Item (CSCI). A management process for establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design and operational information throughout its life. As applied to digital documents, it is the application of configuration management principles to digital documents, their representations, and data files; and the correlation of digital documents to each other and to the products to which they apply. (*MIL-STD-2549*- obsolete publication)
Contractor Support (CS)	Labor, materials, and depreciable assets used in providing all or part of the logistics support to a defense system, subsystem, or related support equipment. DoD 5000.4-M
Cooperative opportunities	"Authority to Engage in Cooperative R&D Projects -- The Secretary of Defense may enter into a memorandum of understanding (or other formal agreement) with one or more major allies of the United States or NATO organizations for the purpose of conducting cooperative research and development projects on defense equipment and munitions." Section 2350a, Title 10 USC, General Military Law
Cost as an Independent Variable (CAIV)	Fiscal constraint is a reality that all participants in the defense acquisition process must recognize. Cost must be viewed as an independent variable. Accordingly, acquisition managers shall establish aggressive but realistic objectives for all programs and follow through by trading off performance and schedule, beginning early in the program (when the majority of costs are determined), to achieve a balanced set of goals, based on guidance from the MDA. Cost as an Independent Variable (CAIV). "CAIV methodology will be utilized throughout the entire life cycle of the acquisition process to ensure operational capability of the total force is maximized for the given modernization investment. CAIV methodology entails the consideration of cost along with required system capabilities; cost is neither dominant nor dependent, but

	rather a peer with other capabilities. Cost will be formally considered for all Milestones after MS 0 by conducting/updating an analysis that relates cost and all system capabilities to the system's battlefield contribution. This approach is not independent of all work to determine specific capabilities; rather it is part of it. Cost performance analyses will be conducted on a continuous basis throughout the life cycle. a. CAIV will be applied to ACAT I, II, III programs. ACAT IV programs shall use CAIV as a guideline. b. PEO and PM shall plan for conducting cost-performance tradeoff studies. Any plans will be documented as appropriate and as directed by the OIPT or WIPT. c. Aggressive cost targets for development, procurement, O&S and disposal must be established at each milestone review. Progress for achieving cost targets shall be presented at each milestone review. d. Cost-performance objectives and cost targets shall be included in procurement documents and contractor statements-of-work, as appropriate." AR 70-1
Critical operational issues and criteria (COIC)	Those decision-maker key operational concerns with bottom line standards of performance which, if satisfied, signify the system is operationally ready to proceed during the production review decision.
Critical Program Information (CPI)	Critical program information, technologies, or systems that, if compromised, would degrade combat effectiveness, shorten the expected combat-effective life of the system, or significantly alter program direction. This includes classified military information or unclassified controlled information about such programs, technologies, or systems. *DoDD 5200.39*
Defense Acquisition Board (DAB)	The DAB shall advise the Under Secretary of Defense (Acquisition, Technology, and Logistics) on critical acquisition decisions. The Under Secretary of Defense (Acquisition, Technology, and Logistics) shall chair the DAB, and the Vice Chairman of the Joint Chiefs of Staff shall serve as vice-chair. DAB membership shall comprise the following executives: Under Secretary of Defense (Comptroller); Under Secretary of Defense (Policy); Under Secretary of Defense (Personnel & Readiness); Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)/Department of Defense Chief Information Officer; Director, Operational Test and Evaluation; and the Secretaries of the Army, Navy, and the Air Force. The reviews shall focus on key

	principles to include interoperability, time-phased requirements related to an evolutionary approach, and demonstrated technical maturity. *DoD 5000.2-R*
Defense Acquisition Workforce Improvement Act (DAWIA)	In 1990 Congress passed the Defense Acquisition Workforce Improvement Act (DAWIA) which established education, training and experience requirements for entry and advancement in the acquisition career field within the Department of Defense (DOD). In 1996, Congress amended the OFPP Act to establish comparable education, training, and experience requirements for civilian agencies. OFPP Policy Letter 97-1.
Demilitarization	The act of destroying the functional or military capabilities of certain types of equipment or material that has been screened through inventory control points and declared surplus or foreign excess. That term includes mutilation, cutting, crushing, scrapping, melting, burning, or alteration to prevent the further use of that equipment or material for its originally intended purpose, and applies equally to equipment or material in serviceable or unserviceable condition.
Department of Defense Strategic Plan	The Secretary of Defense has determined that the 1997 Quadrennial Defense Review is the DoD Strategic Plan required by the Government Performance And Result Act (GPRA). The Quadrennial Defense Review was undertaken during a crucial time of transition to a new era. Even before the attack of September 11, 2001, the senior leaders of the Defense Department set out to establish a new strategy for America's defense that would embrace uncertainty and contend with surprise, a strategy premised on the idea that to be effective abroad, America must be safe at home. It sought to set the conditions to extend America's influence and preserve America's security. The strategy that results is built around four key goals that will guide the development of U.S. forces and capabilities, their deployment and use: ▪ Assuring allies and friends of the United States' steadiness of purpose and its capability to fulfill its security commitments; ▪ Dissuading adversaries from undertaking programs or operations that could threaten U.S. interests or those of our allies and friends; ▪ Deterring aggression and coercion by deploying forward the capacity to swiftly defeat attacks and impose severe penalties for aggression on an adversary's military capability and supporting infrastructure; and

	▪ Decisively defeating any adversary if deterrence fails. A central objective of the review was to shift the basis of defense planning from a "threat-based" model that has dominated thinking in the past to a "capabilities-based" model for the future. This capabilities-based model focuses more on how an adversary might fight rather than specifically who the adversary might be or where a war might occur. It recognizes that it is not enough to plan for large conventional wars in distant theaters. Instead, the United States must identify the capabilities required to deter and defeat adversaries who will rely on surprise, deception, and asymmetric warfare to achieve their objectives.
Development	The process of working out and extending the theoretical, practical, and useful applications of a basic design, idea, or scientific discovery. Design, building, modification, or improvement of the prototype of a vehicle, engine, instrument, or the like as determined by the basic idea or concept. Development includes all efforts directed toward programs being engineered for Service [Army] use but which have not yet been approved for procurement or operation, and all efforts directed toward development engineering and system testing, support programs, vehicles, and weapons that have been approved for production and service deployment. Further, development includes formulating and refining techniques and procedures that improve Army capabilities in non-materiel areas. DSMC Dictionary
Development Test (DT)	Any engineering-type test used to verify status of technical progress, verify that design risks are minimized, substantiate achievement of contract technical performance, and certify readiness for IOT [initial operational test]. Developmental tests generally require instrumentation and measurements and are accomplished by engineers, technicians, or soldier operator-maintainer test personnel. *AR 73-1, Test and Evaluation Policy.* Developmental test and evaluation (DT&E) programs shall: 1. Identify potential operational and technological capabilities and limitations of the alternative concepts and design options being pursued; 2. Support the identification of cost-performance trade-offs by providing analyses of the capabilities and limitations of alternatives;

	3. Support the identification and description of design technical risks; 4. Assess progress toward meeting Critical Operational Issues, mitigation of acquisition technical risk, achievement of manufacturing process requirements and system maturity; 5. Assess validity of assumptions and conclusions from the analysis of alternatives; 6. Provide data and analysis in support of the decision to certify the system ready for operational test and evaluation; and, 7. In the case of automated information systems, support an information systems security certification prior to processing classified or sensitive data and ensure a standards conformance certification. *DoD 5000.2-R*
Doctrine, training, leader development, organization, materiel, and soldiers (DTLOMS)	Requirements determination occurs in the order of doctrine, training, leader development, organization, soldiers and materiel (D-T-L-O-S-M), based on expense and timeliness to field a capability. TRADOC PAM 71-9 identifies the procedures needed to develop requirements documents across the DTLOMS domains and leads to specific documentation that outlines the procedures for warfighting requirements determination in those domains.
DoD Component	One of the military services. Army, Navy (including Marines) or Air Force. Also called, Military Department or Service.
Dual use technology	Dual-use technologies are technologies that meet a military need, yet have sufficient commercial application to support a viable production base. Market research and analysis shall identify and evaluate possible dual-use technology and component development opportunities. Solicitation document(s) shall encourage offerors to use, and the PM shall give consideration to, dual-use technologies and components. System design shall facilitate the later insertion of leading edge, dual-use technologies and components throughout the system life cycle. *DoD 5000.2-R*
Exit Criteria	MDAs use exit criteria to establish goals for ACAT I and ACAT IA programs during an acquisition phase. At each milestone decision point and at each decision review, the PM, in collaboration with the IPT, develops and proposes exit criteria appropriate to the next phase or effort of the program. The OIPT reviews the proposed exit criteria and recommends exit criteria to the MDA. The MDA approves and publishes exit criteria in the ADM. Phase-specific exit criteria normally track progress in

	important technical, schedule, or management risk areas. Unless waived or modified by the MDA, exit criteria must be substantially satisfied for the program to continue with additional activities within an acquisition phase or to proceed into the next acquisition phase, depending on the decision with which they are associated. Exit criteria shall not be part of the APB and are not intended to repeat or replace APB requirements or the entrance criteria specified in DoD Instruction 5000.2. They shall not cause program deviations. The DAES reports the status of exit criteria.
First Unit Equipped Date (FUED)	The first scheduled date for handoff of a new materiel system in a MACOM.
Horizontal technology integration (HTI)	Provides for the application of common technology across multiple systems or items to improve the warfighting capability of the force. It is a modernization requirements and acquisition process in which technology is simultaneously integrated into different weapon systems. *DA PAM 70-3*
Incremental Development	In this process, a desired capability is identified, an end-state requirement is known, and that requirement is met over time by development of several increments, each dependent on available mature technology.
Independent Cost Estimate (ICE)	A cost estimate prepared by an office or other entity that is not under the supervision, direction, or control of the military department, defense agency, or other component of the Department of Defense that is directly responsible for carrying out the development or acquisition of the program. Federal Acquisition Streamlining Act (FASA) states, …"that the independent estimate of the full life-cycle cost of a program -- "(A) Be prepared by an office or other entity that is not under the supervision, direction, or control of the military department, Defense Agency, or other component of the Department of Defense that is directly responsible for carrying out the development or acquisition of the program; and "(B) Include all costs of development, procurement, military construction, and operations and support, without regard to funding source or management control; and "(2) That the manpower estimate include an estimate of the total number of personnel required -- "(A) To operate, maintain, and support the program upon full operational deployment; and "(B) To train personnel to carry out the activities referred to in subparagraph (A)."

Information Technology (IT)	The term "information technology", with respect to an executive agency means any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the executive agency. For purposes of the preceding sentence, equipment is used by an executive agency if the equipment is used by the executive agency directly or is used by a contractor under a contract with the executive agency which (i) requires the use of such equipment, or (ii) requires the use, to a significant extent, of such equipment in the performance of a service or the furnishing of a product. (B) The term "information technology" includes computers, ancillary equipment, software, firmware and similar procedures, services (including support services), and related resources. (C) Notwithstanding subparagraphs (A) and (B), the term "information technology" does not include any equipment that is acquired by a Federal contractor incidental to a Federal contract. Title 40, 40 CFR, Chpt 25, Sec 1401
Initial Capabilities Document (ICD)	The ICD describes materiel capabilities in broad, time-phased and operational goals. The ICD document is written to accommodate the widest range of possible materiel solutions.
Initial Operational Capability (IOC)	The first attainment of the capability to use effectively a weapon, item of equipment, or system of approved specific characteristics that is operated by an adequately trained, equipped, and supported military unit or force.
Initial Operational Test and Evaluation (IOT&E)	All operational test and evaluation conducted on production or production representative articles, to support the decision to proceed beyond low-rate initial production for a weapon system program, or to deploy the tested capability for an AIS program. It is conducted to provide a valid estimate of expected system operational effectiveness and operational suitability. IOT&E shall use production representative systems, actual operational procedures, and personnel with representative skill levels.
Integrated Concept Team (ICT)	An integrated team made up of people from multiple disciplines formed for the purposes of developing operational concepts, developing materiel requirements documents, developing other DTLOMS requirements documents, when desired, and resolving other requirements determination issues. *AR 70-1*

	The ICT produces the ICD, capstone requirements document (CRD), and CDD. ICTs are formed to accomplish the following: (1) Develop capstone and subordinate TRADOC Pam 525-series concepts and associated future operational capabilities (FOCs). (2) Develop new and validate current FOCs published in TRADOC Pam 525-66. (3) Determine and document warfighting mission needs analysis across all DTLOMS domains. *TRADOC PAM 71-9*
Integrated Product Team (IPT)	A working level team of representatives from all appropriate functional disciplines working together to build successful and balanced programs, identify and resolve issues, provide recommendations to facilitate sound and timely decisions. *AR 70-1*
Interoperability	Interoperability is the ability of systems, units, or forces to provide data, information, materiel, and services to and accept the same from other systems, units, or forces, and to use the data, information, materiel, and services so exchanged to enable them to operate effectively together. Interoperability within and among United States forces and U.S. coalition partners is a key goal that must be satisfactorily addressed for all Defense systems so that the Department of Defense has the ability to conduct joint and combined operations successfully. The use of standardized data shall be considered to facilitate interoperability and information sharing. The Department of Defense must have a framework for assessing the interrelationships among and interactions between U.S., Allied, and coalition systems. Mission area focused, integrated architectures shall be used to characterize these interrelationships. This end-to-end approach focuses on mission outcomes and provides further understanding of the full range of interoperability issues attendant to decisions regarding a single program or system. DoDD 5000.1
Joint Requirements Oversight Council (JROC)	The JROC has the following responsibilities: (1) Assist the Chairman in coordinating, among combatant commands, Service force providers, and other DOD components, the identification and assessment of joint requirements and priorities for current and future military capabilities, forces, programs, and resources, consistent with the National Military Strategy (NMS) and the total resource levels projected by the Secretary of Defense in the DPG and fiscal guidance.

	(2) Assist the Chairman in providing up-front guidance, oversight, and validation on complex requirements integration. (3) Assist the Chairman in developing and/or validating operational and mission area integrated architectures and operational concepts required by the NMS and to facilitate the realization of JV 2020 warfighting capabilities. (4) Assist the Vice Chairman of the Joint Chiefs of Staff in his role as the Vice Chairman of the Defense Acquisition Board (DAB) by reviewing and approving military need and joint interoperability requirements for potential ACAT I programs, JROC Special Interest programs, and Major Acquisition Information Systems (MAIS) as may be directed by the Secretary of Defense or Chairman of the Joint Chiefs of Staff; and by considering cost, schedule, and performance and nonmaterial alternatives for acquisition programs identified to meet military needs (i.e., alternatives involving changes in doctrine, tactics, training, or organization). CJCSI 5123.01A
Joint Technical Architecture – Army (JTA-A)	A Technical Architecture (TA) is the minimal set of rules governing the arrangement, interaction, and interdependence of the parts or elements whose purpose is to ensure that a conformant system satisfies a specified set of requirements. The technical architecture identifies the services, interfaces, standards, and their relationships. It provides the technical guidelines for implementation of systems upon which engineering specifications are based, common building blocks are built, and product lines are developed. The Joint Technical Architecture -- Army (JTA-Army) has three mutually supporting objectives. The first and foremost objective is to provide the foundation for a seamless flow of information and interoperability among all tactical, strategic, and sustaining base systems that produce, use, or exchange information electronically. The second objective is to provide guidelines and standards for system development and acquisition that will dramatically reduce cost, development time, and fielding time for improved systems. The third objective is to influence the direction of the information industry's technology development and research & development investment so that it can be more readily leveraged in Army systems.
Key Performance Parameters (KPP)	Those capabilities or characteristics considered most essential for successful mission accomplishment. Failure to meet a key performance parameter threshold (KPP) in the Capabilities Development Document (CDD) can be

	cause for the concept or system selection to be reevaluated or the program to be reassessed or terminated. KPP are validated by the JROC. KPP in the CDD are included in the Acquisition Program Baseline (APB).
Live Fire Test and Evaluation (LFT&E)	Live Fire Test and Evaluation must be conducted on a covered system, major munition program, missile program, or product improvement to a covered system, major munition program, or missile program before it can proceed beyond low-rate initial production. A covered system is any vehicle, weapon platform, or conventional weapon system that includes features designed to provide some degree of protection to users in combat and that is an ACAT I or II program. Depending upon its intended use, a commercial or non-developmental item may be a covered system, or a part of a covered system
Low Rate Initial Production (LRIP)	The objective of this activity is to produce the minimum quantity necessary to: provide production configured or representative articles for operational tests, establish an initial production base for the system; and permit an orderly increase in the production rate for the system, sufficient to lead to full-rate production upon successful completion of operational testing.
Major Army commands (MACOM) (Specialized)	Specialized major army commands in the continental United States. Their roles, missions, and functions focus on command, control, communications, and intelligence but also include significant responsibilities as Combat Developers and Trainers, and Materiel Developers and Sustainers. These Major Army Commands are not major elements of U.S. Unified Commands but may have various size subordinate units, detachments, and activities distributed throughout the Army and the U.S. Unified Commands not only in the Continental United States (CONUS) but also worldwide. Combatant warfighting units - Unified Commands and Army Components. Currently, nine United States Unified Combatant Commands exist. Their missions are assigned by the Secretary of Defense with the advice and counsel of the Chairman of the Joint Chiefs of Staff. a. Most Unified Commands consist of Army, Navy, Air Force, and Marine Corps components. b. Each of the following major commands is assigned as the Army component of its respective Unified Command. These are: U.S. Army Europe and 7th U.S. Army, U.S. Army South, U.S. Army Pacific and 8th U.S. Army, U.S. Army Special Operations Command, and U.S. Army

	Military Traffic Management Command. The 3rd U.S. Army is an element of Forces Command as well as being the Army component of the U.S. Central Command. The U.S. Army Space Command is an element of the U.S. Army Space and Strategic Defense Command as well as being the Army component of the U.S. Space Command. All these Army units are trained and equipped for combatant warfighting missions --- they may also be assigned operations other than war during peace and periods of conflict. DA PAM 10-1 All MACOM CDRs will -- a. Monitor RDTE projects and identify needs that affect the MACOMs mission and responsibility. b. Support RDTE field activities, support testing, and monitor RDA projects to include potential for standardization and interoperability. c. Produce designated warfighting concepts, as appropriate and forward to TRADOC for review and appropriate action. d. Forward critical, time-sensitive ONSs to DCSOPS for review/approval/action. Provide information copy of ONS to TRADOC for review/appropriate action. e. Participate in warfighting experiments, as appropriate. f. Submit C4IOA and systems architecture (SA) to HQ, TRADOC for integration into the Army-wide C4I OA. AR 70-1
Major Automated Information System (MAIS) Program	An automated information system acquisition program that is estimated to require program costs in any single year in excess of $32 million, total program costs in excess of $126 million, or total life cycle costs in excess of $378 million (FY 2000 constant dollars). *CJCSI 3170.01B*
Major Automated Information System Acquisition Review Council (MAISARC)	High level body that recommends decisions on major automated information systems to the Army Acquisition Executive. Similar to the ASARC.
Materiel Developer (MATDEV)	The RDA command, agency, or office assigned responsibility for the system under development or being acquired. The term may be used generically to refer to the RDA community in the materiel acquisition process (counterpart to the generic use of CBTDEV). *AR 70-1*
Matrix support	Defined as all categories of functional support provided to the materiel developer (MATDEV) necessary to execute or attain the acquisition objective, excluding the core office (TDA) capability. *AR 70-1*

Milestone Decision Authority (MDA)	The individual designated in accordance with criteria established by the Under Secretary of Defense for Acquisition, Technology, and Logistics, or by the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (CIO) for AIS programs, to approve entry of an acquisition program into the next phase of the acquisition process. *DoDD 5000.1*
Milestone Decision Review (MDR)	MDRs are formal decision briefings to the milestone decision authority (MDA). These reviews provide the gateway for program progress through the acquisition phases.
Military occupational specialty (MOS)	The MOS identifies a group of duty positions that requires closely related skills. A soldier qualified in one duty position in a MOS may, with adequate OJT [on the job training], perform in any of the other positions that are at the same level of complexity or difficulty. The MOS broadly identifies types of skill without regard to levels of skill. *AR 611-1*
Mission Critical Computer Resources (MCCR)	Elements of computer hardware, software, or services whose function, operation or use involves intelligence activities, cryptological activities related to national security, command and control of military forces, and/or equipment which is an integral part of a weapon or weapon system.
Mission Need Statement (MNS)	A formatted non-system-specific statement containing operational capability needs and written in broad operational terms. It describes required operational capabilities and constraints to be studied during the Concept Exploration and Definition Phase [now named Concept and Technology Development Phase]. *CJCSI 3170.01B*
Modeling & Simulation (M&S)	The development and use of live, virtual, and constructive models including simulators, stimulators, emulators, and prototypes to investigate, understand, or provide experiential stimulus to either (1) conceptual systems that do not exist or (2)real life systems which cannot accept experimentation or observation because of resource, range, security, or safety limitations. This investigation and understanding in a synthetic environment will support decisions in the domains of research, development, and acquisition and analysis, or transfer necessary experiential effects in the education, training, and military operations domain. DoDI 5000.61
National Security System (NSS)	Any telecommunications or information system operated by the U.S. Government, the function, operation, or use of which involves:

	▪ intelligence activities; ▪ cryptologic activities related to national security; ▪ command and control of military forces; ▪ equipment that is an integral part of a weapon or weapons system. DoDD 5000.1
New equipment training (NET)	The identification of personnel, training, and training aids and devices and the transfer of knowledge gained during development from the materiel developer/provider to the trainer, user, and supporter.
Operational Test (OT)	Operational test and evaluation (OT&E) programs shall be structured to determine the operational effectiveness and suitability of a system under realistic conditions (e.g., combat) and to determine if the minimum acceptable operational performance requirements as specified in the ORD have been satisfied. *DoD 5000.2-R*
Overarching Integrated Product Team (OIPT)	The OIPT is a team appointed by the MDA, commensurate with the ACAT level, to provide assistance, oversight and independent review for the MDA, as the program proceeds through its acquisition cycle. *AR 70-1*
Overarching Integrated Product Team (OIPT) Leader	The person in the Office of the Secretary of Defense who leads the Overarching Integrated Product Team and is responsible for providing an assessment of each assigned program. The OIPT Leader is not in the decision-making line of authority for programs. *DoDI 5000.2*
Planning, Programming, Budgeting and Execution System (PPBES)	The PPBES is the Army's primary resource management system. A major decision-making process, the PPBES interfaces with OSD and joint planning and links directly to OSD programming and budgeting. It develops and maintains the Army portion of the defense program and budget. It supports Army planning, and it supports program development and budget preparation at all levels of command. It supports execution of the approved program and budget by both headquarters and field organizations. During execution, it provides feedback to the planning, programming, and budgeting processes. *AR 1-1, Planning, Programming, Budgeting, and Execution System*
Principal Staff Assistant (PSA)	The Under Secretary of Defense for Acquisition, Technology, and Logistics is the Principal Staff Assistant and advisor to the Secretary and Deputy Secretary of Defense for all matters relating to the DoD Acquisition System, research and development, advanced technology, developmental test and evaluation, production, logistics, installation management, military construction, procurement, environmental security, and nuclear, chemical, and biological matters. DoDD 5134.1

Qualitative and Quantitative Personnel Requirements Information (QQPRI)	Organizational, doctrinal, training, duty position and personnel information used to develop the Basis of Issue Plan (BOIP). Prepared by the materiel developer in coordination with the combat developer.
Requirements Generation Process	The process of analyzing, determining, and prioritizing Army requirements for, doctrine, training, leader development, organizations, soldier development, and equipment and executing or (in the case of doctrine, training and materiel, initiating) solutions, within the context of the force development process.
Research (basic)	Scientific study and experimentation directed towards increasing knowledge and understanding in fields directly related to explicitly stated long-term national security needs. Specifically, research includes the scientific study and experimentation directed toward increasing knowledge and understanding in those fields of the physical, engineering, environmental, bio-medical, and behavioral social sciences directly related to national security needs. Research provides fundamental knowledge for the solution of identified military problems, and a base for subsequent exploratory and advanced developments. DSMC Dictionary
Research, Development, Test, and Evaluation (RDTE)	Activities for the development of a new system that include basic and applied research, advanced technology development, demonstration and validation (DEM/VAL), engineering development, developmental and operational testing and the evaluation (OT&E) of test results. RDTE includes activities to expand the performance of fielded systems. Also, an appropriation category that includes funds allocated to the future years defense program (FYDP) major force program 6.
Risk	Risk is a measure of the potential inability to achieve overall program objectives within defined cost, schedule, and technical constraints and has two components: (1) the probability or likelihood of failing to achieve a particular outcome, and (2) the consequences or impacts of failing to achieve that outcome.
Selected Acquisition Report (SAR)	The SAR provides the status of total program cost, schedule, and performance, as well as program unit cost and unit cost breach information; and, in the case of joint programs, the SAR shall include such information for all joint participants. Each SAR shall also include a full life-cycle cost analysis for the reporting program and its antecedent program.
Spiral Development	In this process, a desired capability is identified, but the end-state requirements are not known at program

	initiation. Those requirements are refined through demonstration and risk management; there is continuous user feedback; and each increment provides the user the best possible capability. The requirements for future increments depend on feedback from users and technology maturation.
System training plan (STRAP)	A detailed plan developed by the trainer to reflect all training support required for weapon or equipment systems. The plan describes the training required for both individual and collective training and for each MOS associated with the weapon or equipment system.
Test and Evaluation Master Plan (TEMP)	The Test and Evaluation Master Plan (TEMP) documents the overall structure and objectives of the test and evaluation program. It provides a framework within which to generate detailed test and evaluation plans and it documents schedule and resource implications associated with the test and evaluation program. The TEMP identifies the necessary developmental test and evaluation, operational test and evaluation, and live fire test and evaluation activities. It relates program schedule, test management strategy and structure, and required resources to: (1) Critical operational issues; (2) Critical technical parameters; (3) Objectives and thresholds derived from the Operational Requirements Document (ORD); (4) Evaluation criteria; and (5) Milestone decision points. *DoD 5000.2-R*
Test Schedule and Review Committee (TSARC)	The Test Schedule and Review Committee (TSARC) is a General Officer Committee, chaired by the Commander, OPTEC. It meets semiannually to provide recommended priorities and resource support responsibilities for user supported tests to the DA DCSOPS for approval and implementation. The end products of the TSARC are the FYTP, and test priority lists for the current and budget year. b. Responsibilities. Resource support responsibilities are provided in detail in outline test plans (OTP) submitted to the TSARC by operational and developmental testers. (1) All direct costs for operational testing are delineated in an OTP. It lists the necessary resources and the administrative requirements to support an operational test and evaluation, as well as associated suspense dates and test milestones. (2) When included in the approved FYTP, an OTP becomes a formal resource tasking document for test execution and resource allocation within program and budget constraints.

	(3) OTPs are prepared by the operational tester as designated by HQDA DCSOPS (or materiel developer for DT when non-organic or user troops are required) and maintained by Headquarters, OPTEC, for the TSARC process. OPTEC is the operational tester for most Army Acquisition Category and DOT&E oversight program tests. However, USAISC, USAHSC, USAINSCOM, and others are designated as the operational tester for specific programs. (4) Preparation of the OTP begins following approval of the requirements document and a request from the Project Manager/Program Executive Officer to OPTEC for evaluator and tester members for the T&E IPT. OPTEC establishes OTP milestones concurrent with the assignment of testers and evaluators. Final TSARC approval of the OTP should take place no later than 24 months before test execution and in no case less than one year prior to execution. These milestones are critical to align testing and unit training objectives and minimize adverse effects of testing on user test unit and personnel readiness. (5) Test requirements that do not allow the one-year notification can be approved only on an exception basis by submitting a proposed OTP to the Chairman of the TSARC (OPTEC Commander) for "Out-of-Cycle" coordination by the TSARC members and subsequent approval by DA DCSOPS. Such a submission can only be submitted by a memo of transmittal, signed by a General Officer TSARC member. (6) No OTP will be approved without an Army approved TEMP. c. Test priorities. The TSARC establishes priorities among the tests, resolves resource issues and conflicts, and presents a prioritized package of OTPs to the DA DCSOPS for approval. Once approved the compendium of OTPs are taskers for test support and collectively are known as the Army's current FYTP. The priority lists become guidelines whereby supporting commands apply limited resources in rank order. OPTEC publishes and distributes the approved FYTP semiannually. d. Committee support. The TSARC is supported by two working group sessions that introduce new requirements, revise current plans as needed, and develop and work on test support issues. These Initial TSARC Working Group and Mid-Cycle Working Group sessions are chaired by the DCSOPS of OPTEC. Detailed procedures of the working

	groups and the General Officer TSARC are provided in the TSARC Handbook published by OPTEC. The charter, scope, membership and responsibilities of the TSARC are provided in AR 15-38.
Threat	Ability of an enemy or potential enemy to limit, neutralize, or destroy effectiveness of current or projected mission, organization, or item of equipment. Statement of that threat is prepared in sufficient detail to support Army planning and development of concepts, doctrine, training, and materiel. Statement of a capability prepared in necessary detail, in context of its relationship to specific program or project, to provide support for Army planning and development of operational concepts, doctrine, and materiel. AR 381-11
Training Aids Devices Simulators and Simulations (TADSS)	TADSS are developed and acquired to support training at the unit and Combat Training Centers (CTCs) and within the institutional training base. TADDS are categorized as either system or non-system. System TADSS are designed for use with a system, family of systems or item of equipment, including subassemblies and components. They may be stand-alone, embedded, or appended. Non-system TADSS are designed to support general military training and non-system specific training requirements.
Training Developer (TNGDEV)	Command or agency that formulates, develops, and documents or produces training concepts, strategies, requirements (materiel and other), and programs for assigned mission areas and functions. Serves as user (trainer and trainee) representative during acquisitions of their approved training materiel requirements (MNS and ORD) and training program developments. *AR 70-1*
Uniform Code of Military Justice (UCMJ)	Military justice relates to legal systems within each nation which govern order and discipline for members of their armed forces. For example, U.S. armed forces members are subject to the Uniform Code of Military Justice (UCMJ). The following military justice-related topics are especially complementary to the overall framework of human rights: the rights and responsibilities of military personnel; the role of the military commander in military justice; and effective military justice systems and how they ensure accountability for and deterrence from human rights abuses by military personnel. *DISAM* Historical development - the object of the disciplinary code is to ensure that the will of the commander is put into effect. Military law therefore traces its origins to the prerogative power of rulers. In Rome, just as a sector of

	civil law developed from the imperium of the magistrates, so did military law derive from the imperium of those same magistrates in their capacity as commanders. *Encyclopedia Britannica* UCMJ - Congressional Code of Military Criminal Law applicable to all military members worldwide Link to the UCMJ: http://www.au.af.mil/au/awc/awcgate/ucmj.htm