Applying CMMI Principles to the Military Certification Process of Legacy Aircraft

Michele Bruno
The Boeing Company

michele.j.bruno@boeing.com
610-591-6949
Chinook Introduction

- First introduced in 1962
  - Deployed in Vietnam
- Multi-mission, heavy-lift transport
- 1,179 Chinooks Worldwide
- Service life projected beyond 2030
- Strong International Demand
  - Civil and military applications
Civilian Operations

- Ability to land on unprepared ground

Chinooks continue relief missions
Heavy Lift Capability

Lifting capacity of 21,500-pounds
Certification Introduction

- A demonstrated capability of an aircraft to function satisfactorily within established limits

Military Certification vs. Civil Certification
- Militarily qualification requires demonstration of airworthiness to protect crew and passengers
- Civilian certification concentrates on safety of everyone else
Why Certification?

Public Concerns for Safety

- England grounded aircraft for 9 years
- Spain grounded aircraft until sufficient evidence to release
- Singapore request data 6 years after delivery

Foreign Military Concerns
Methods of Certification varies widely

- Requirements
- Process
- Reciprocity

- FAA Orders
- DEF STD 55 & 56
- Communication/Navigation/Surveillance
- Acceptable Level Of Risk
- CNS
- MIL-HDB-516B
- AER-P-2
- Release To Flight
- Civil Authorities
New Type Certification

1. Define Certification Regulation Set
2. Release Certification Plan
3. Baseline Requirements & Method of Compliance
4. Compliance
5. Conformity
6. Pilot / Maintenance Training
7. Basis Of Certification
8. Data Repository
9. Type Certified Aircraft
Project Certification Process

Legend

- Mandatory Project Work Instruction
- Process may be tailored
Legacy Aircraft Certification

Performance Requirements → Method Of Compliance

Regulatory Agency

Rule

N → Define Flight Limitation

Y → Artifact

N → Historical Data

Y → Statistical Modeling

Basis of Certification

Iterative / Negotiated Process
The purpose of this process is to establish a certification baseline for the H-47 aircraft.
Applying CMMI Model to the Certification Process

- Process Area
  - Specific Goals
    - Specific Practices
      - Typical Work Products
      - Subpractices
  - Generic Goals
    - Generic Practices
      - Subpractices
      - Generic Practice Elaborations
  - Purpose Statement
  - Introductory Notes
  - Related Process Areas

Aircraft configuration and rule set
Applying CMMI Model to the Certification Process

- Process Area
  - Specific Goals
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      - Typical Work Products
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Gaps Analysis between rule sets and standards

KEY: Required  Expected  Informative
Applying CMMI Model to the Certification Process

SG2: Corrective actions are managed to closure
Applying CMMI Model to the Certification Process

GG2: The process is institutionalized as a managed process