

GAO

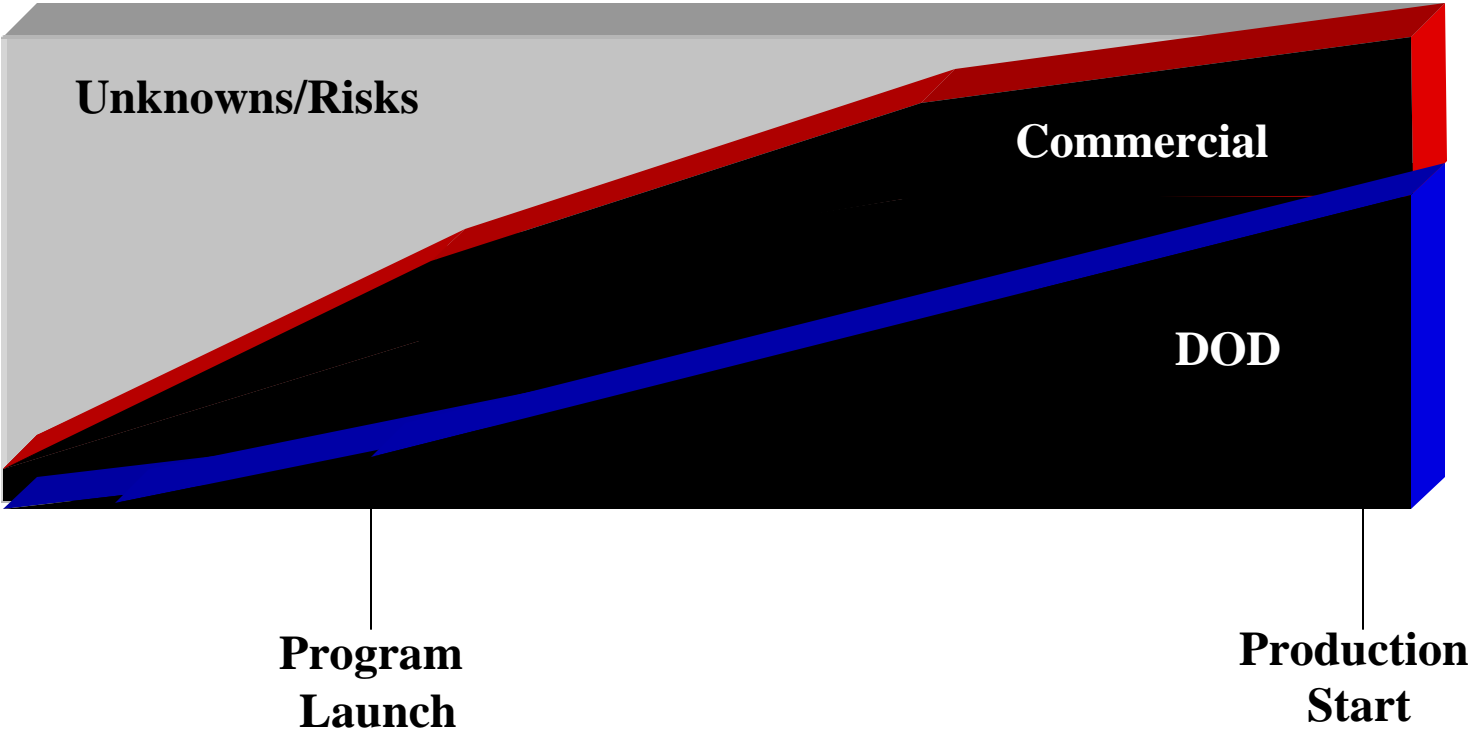
# Presentation to the S&T Conference on the Transition of Technology to Acquisition



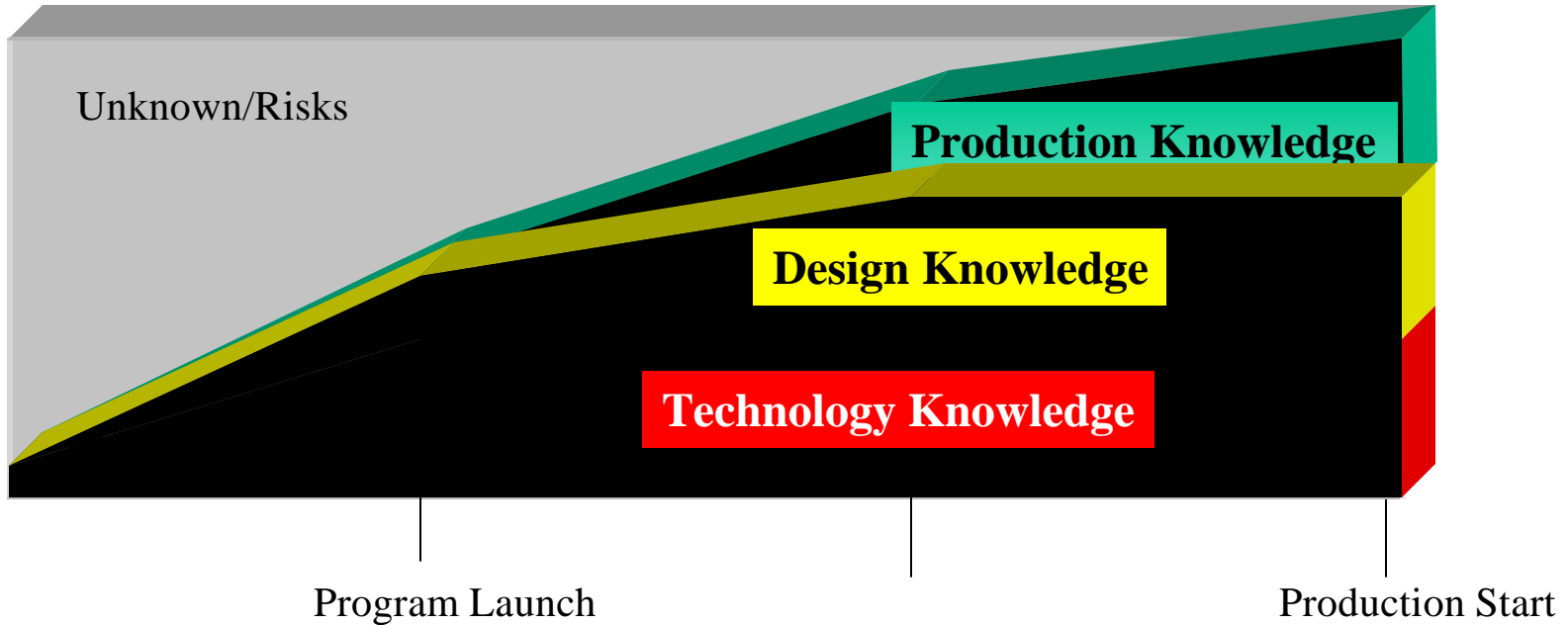
## Better Management of Technology Development Can Improve Weapon System Outcomes

Oct. 26, 1999

# Comparison of Commercial and DOD Practices



# Commercial Practices



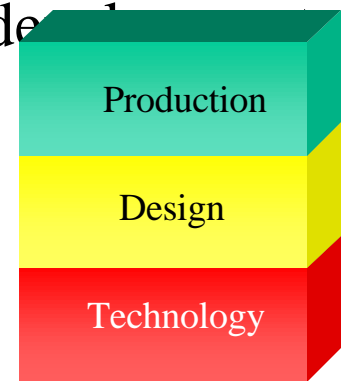
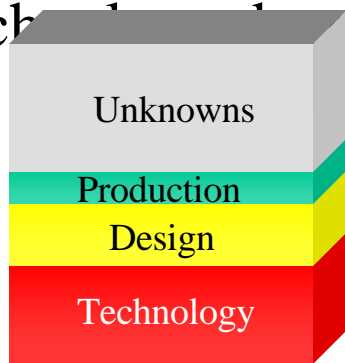
KNOWLEDGE POINT 1  
 READINESS LEVEL 9

KNOWLEDGE POINT 2  
 90% DRAWINGS

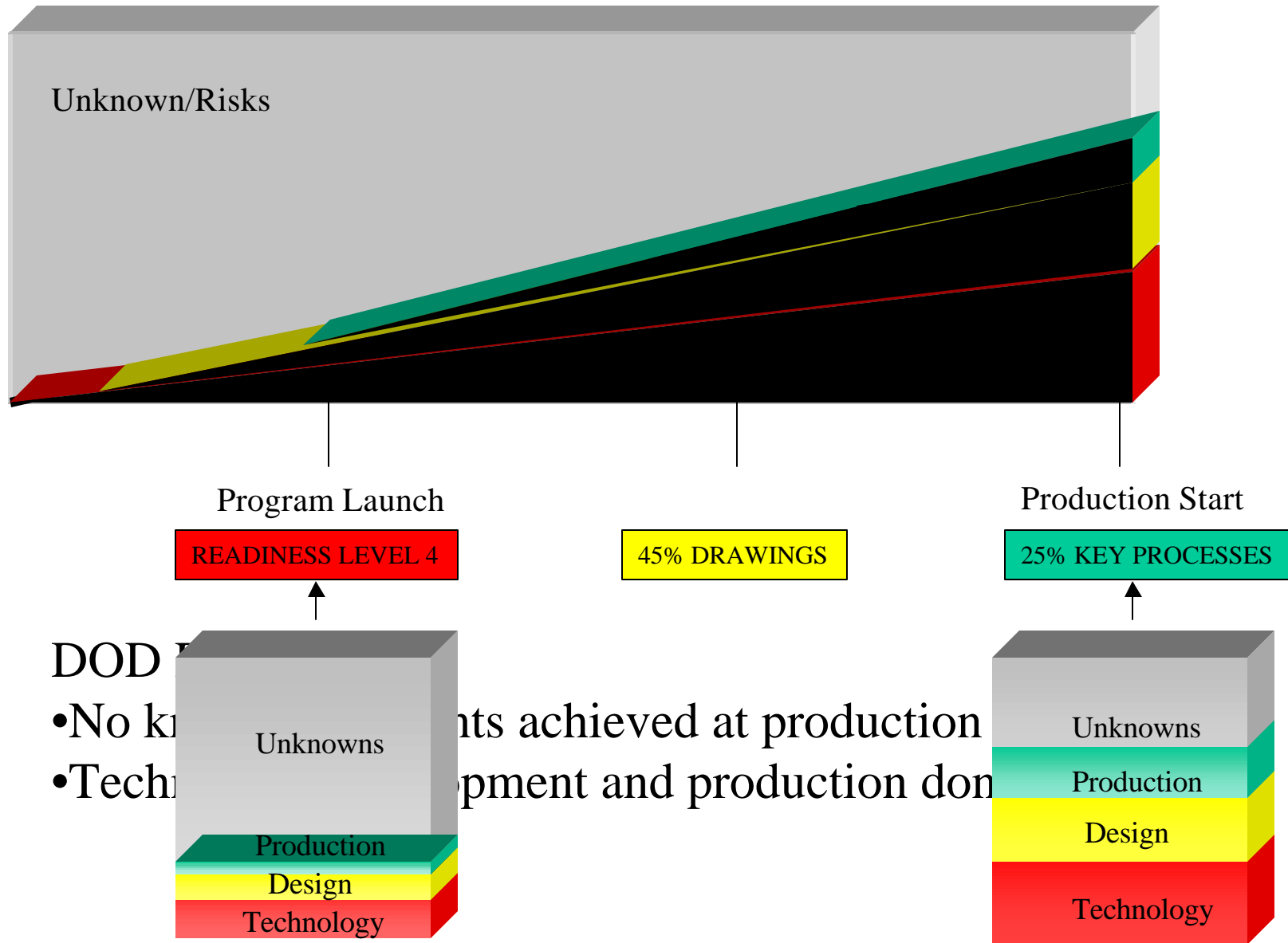
KNOWLEDGE POINT 3  
 100% KEY PROCESSES

Best Practice

- Knowledge based ↑
- Separate technology development from product development



# DOD Practices

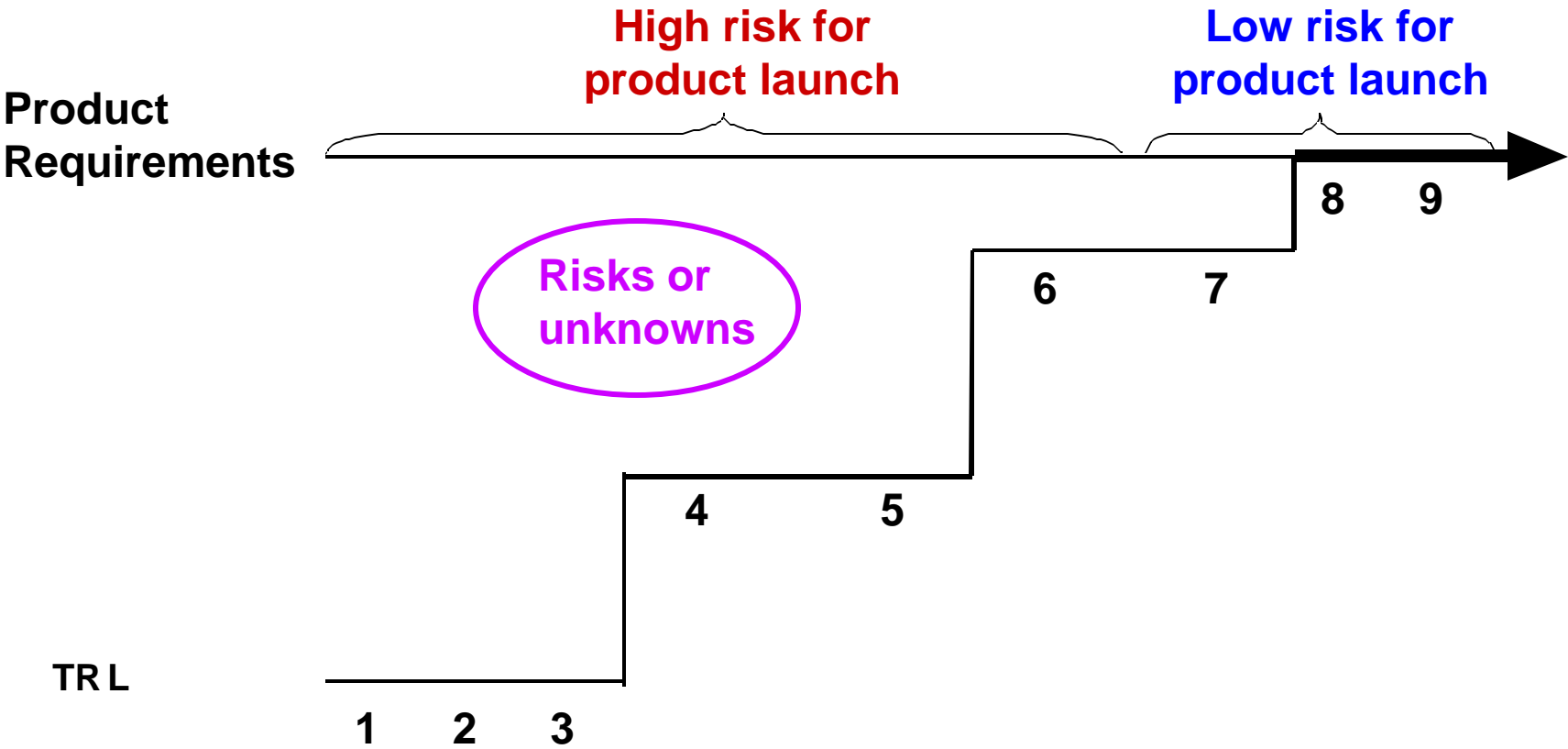


- DOD P
- No k
  - Tech

## Technology Readiness Levels (TRLs) As Indicators of Maturity

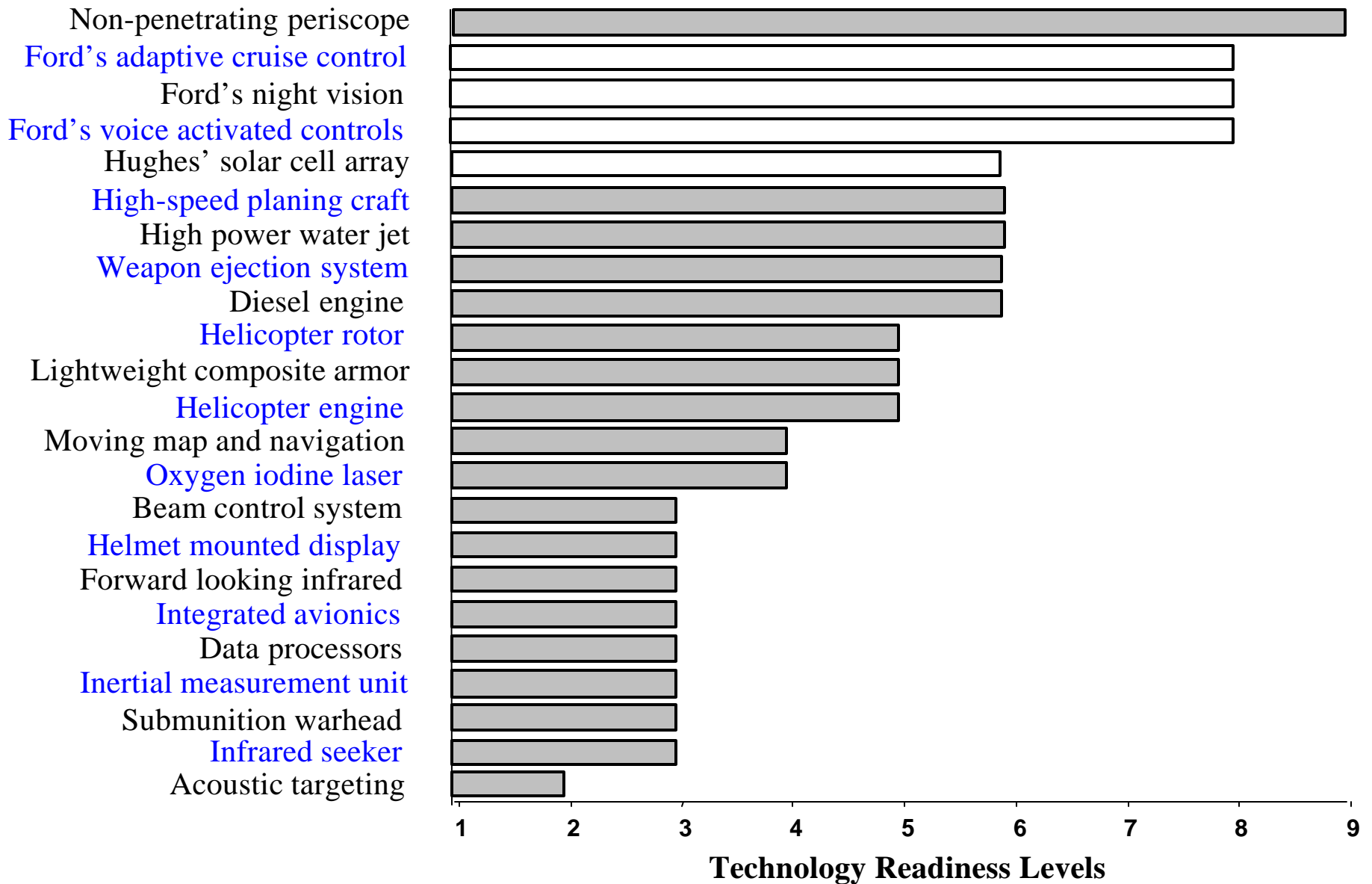
- Developed by NASA
- Adapted by AFRL
- Are reliable indicators of maturity
- Can measure progress toward inclusion
- Can presage program consequences

# Using TRLs to Match Technology with Product Requirements

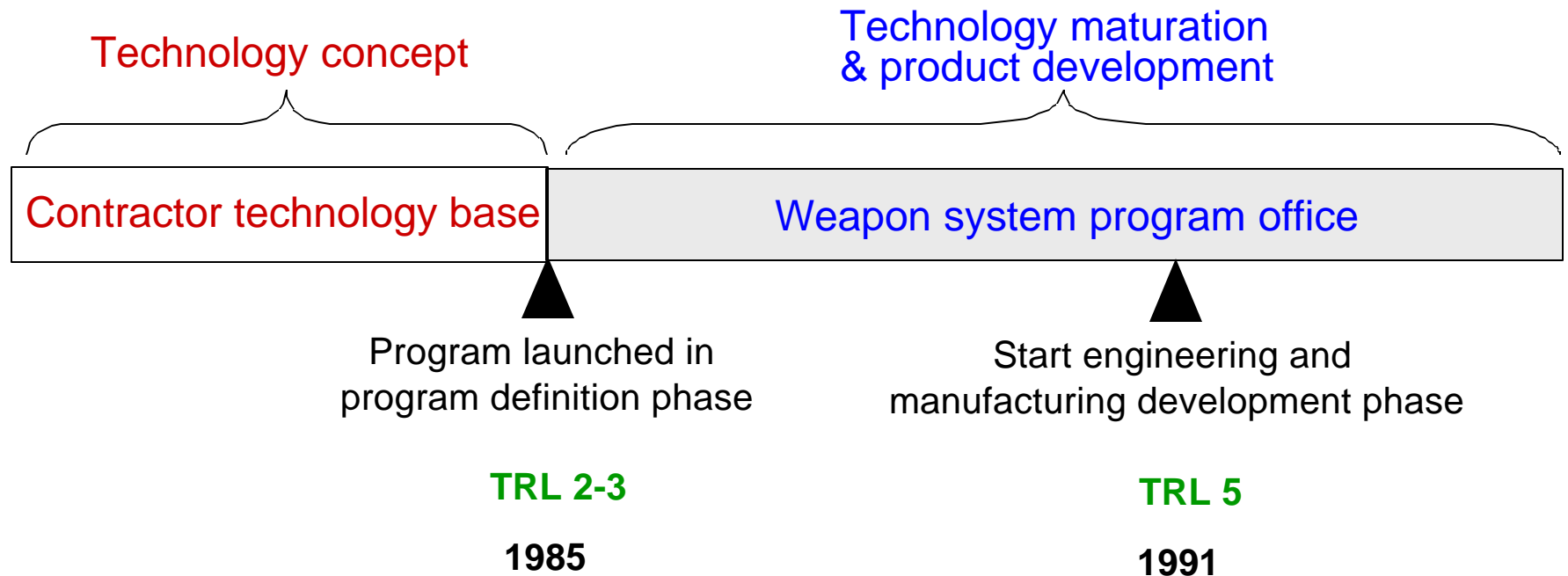




# TRLS for Technologies at Program Start

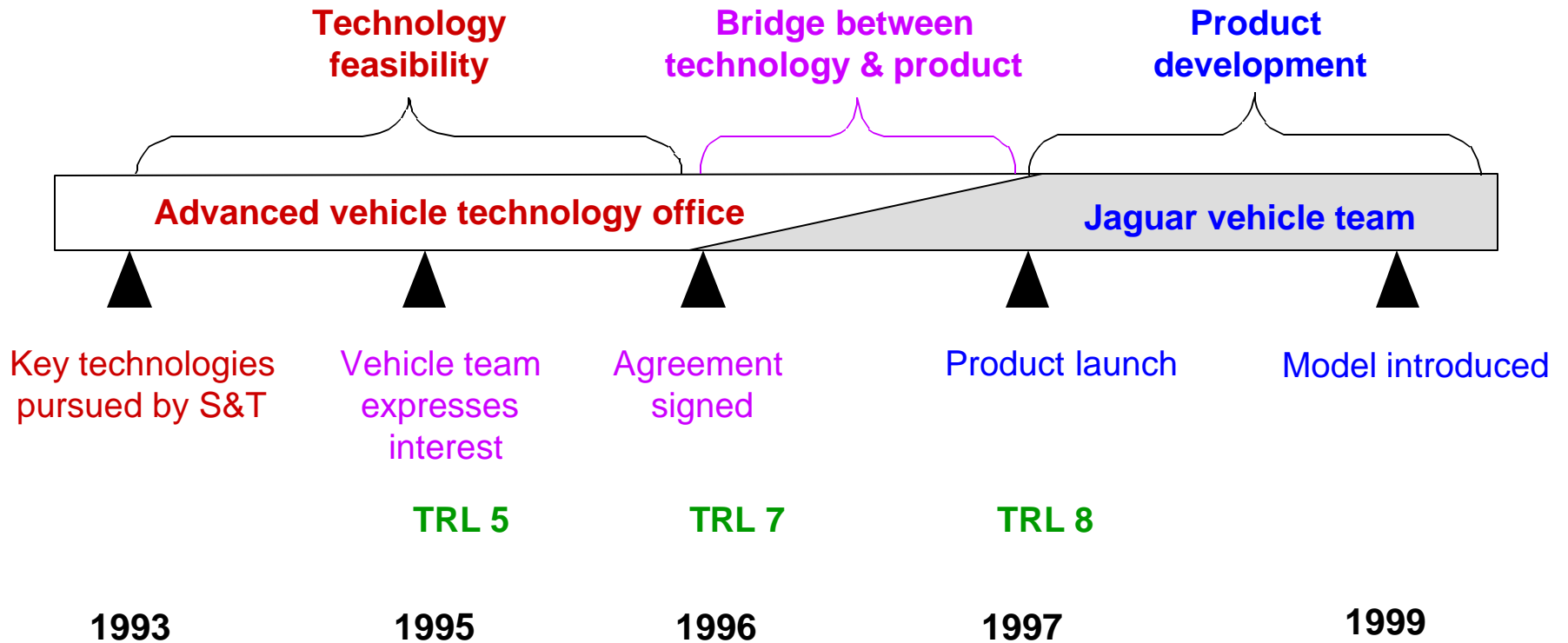


# Assimilation of New Technology Into a Guided Munitions Program

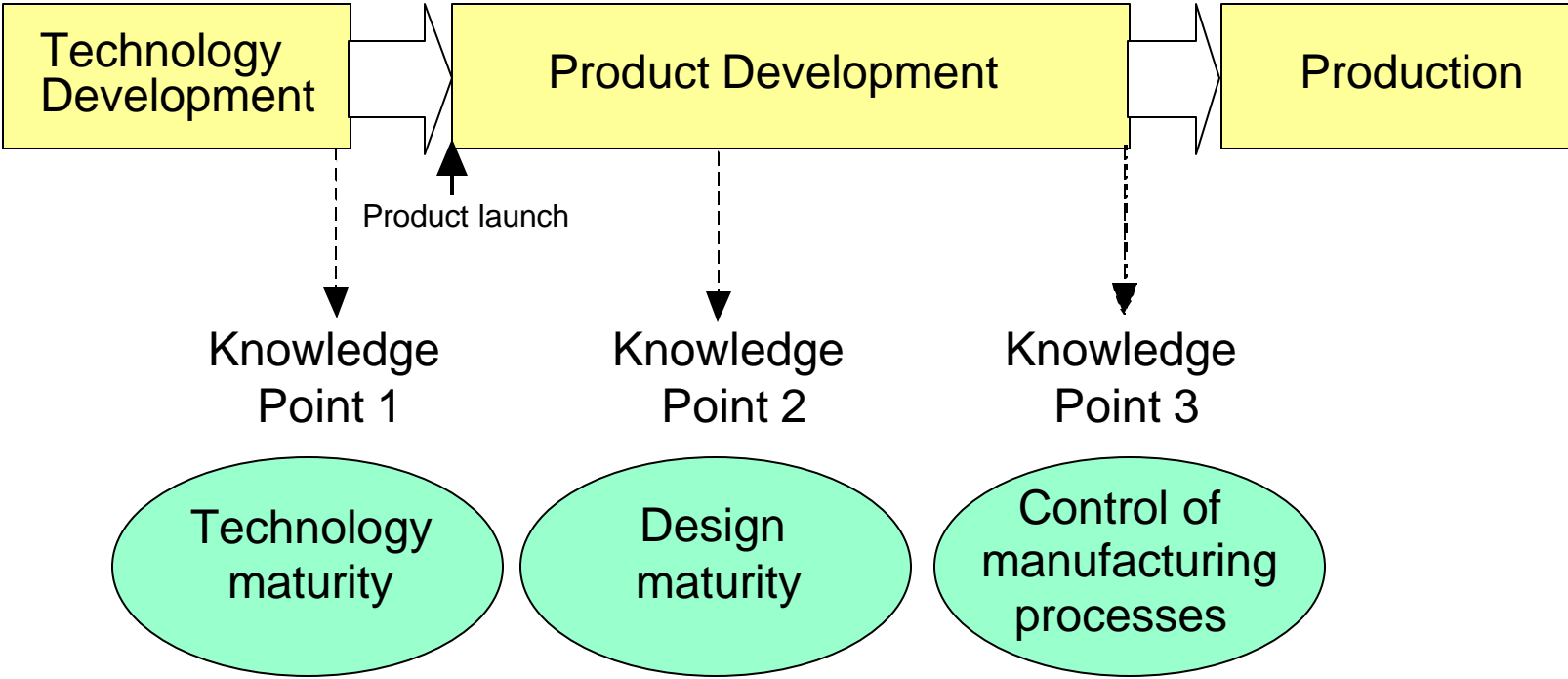




# Adaptive Cruise Control Technology and Jaguar Requirements



# Optimum Cycle for Developing a Product



# Impediments

- S&T budget does not cover higher level demos
- S&T role seen as limited to generic technology
- Weapon system programs have bigger budgets
- Strong incentives to include immature technologies in programs
- Few incentives to recognize risk

## Recommendations

- Adopt a knowledge-based approach
- Separate technology development from product development
- Attain TRL 7 before launching program
- Develop options for managing the “bridge”
- Empower technologists and program managers to be good gatekeepers

# Implications

- Role and funding shift between S&T organizations and program offices
- Preserve traditional work in long-term, generic R&D
- More disciplined requirements process
- Follow-through by DOD and Congress on individual program/budget decisions

## References

- **BEST PRACTICES: Successful Application to Weapon Acquisitions Requires Changes in DOD's Environment (GAO/NSIAD-98-56, 2/24/98)**
- **BEST PRACTICES: Better Management of Technology Development Can Improve Weapon System Outcomes (GAO/NSIAD-99-162, 7/30/99)**
- Website <http://www.gao.gov>