RAPID APPLICATION DEVELOPMENT
AT LOCKHEED MARTIN
SKUNK WORKS
CURRENT AND FUTURE THRUSTS

- EVOLUTIONARY DEVELOPMENT VERSUS WATERFALL
- SYSTEM / SOFTWARE REUSE
- SYSTEM / SOFTWARE SYNTHESIS
- TASK REDUCTION THROUGH AUTOMATION
- LEVERAGE COMMERCIAL TECHNOLOGY

INNOVATION IN AFFORDABILITY AS WELL AS PERFORMANCE
KELLY JOHNSON'S 14 RULES
THE BASIC OPERATING RULES OF THE SKUNK WORKS

1. THE SKUNK WORKS MANAGER MUST BE DELEGATED PRACTICALLY COMPLETE
   CONTROL OF HIS PROGRAM IN ALL ASPECTS. HE SHOULD REPORT TO A DIVISION
   PRESIDENT OR HIGHER.

2. STRONG BUT SMALL PROJECT OFFICES MUST BE PROVIDED BOTH BY THE
   CUSTOMER AND INDUSTRY.

3. THE NUMBER OF PEOPLE HAVING ANY CONNECTION WITH THE PROJECT MUST BE
   RESTRICTED IN AN ALMOST VICIOUS MANNER. USE A SMALL NUMBER OF GOOD
   PEOPLE (10% TO 25% COMPARED TO THE SO-CALLED NORMAL SYSTEM).

4. A VERY SIMPLE DRAWING AND DRAWING RELEASE SYSTEM WITH GREAT
   FLEXIBILITY FOR MAKING CHANGES MUST BE PROVIDED.

5. THERE MUST BE A MINIMUM NUMBER OF REPORTS REQUIRED, BUT IMPORTANT
   WORK MUST BE RECORDED THOROUGHLY.

6. THERE MUST BE A MONTHLY COST REVIEW COVERING NOT ONLY WHAT HAS BEEN
   SPENT AND COMMITTED BUT ALSO PROJECTED COSTS TO THE CONCLUSION OF
   THE PROGRAM. DON'T HAVE THE BOOKS NINETY DAYS LATE AND DON'T
   SURPRISE THE CUSTOMER WITH SUDDEN OVERRUNS.

7. THE CONTRACTOR MUST BE DELEGATED AND MUST ASSUME MORE THAN NORMAL
   RESPONSIBILITY TO GET GOOD VENDOR BIDS FOR SUBCONTRACT ON THE
   PROJECT. COMMERCIAL BID PROCEDURES ARE VERY OFTEN BETTER THAN
   MILITARY ONES.
KELLY JOHNSON’S 14 RULES
THE BASIC OPERATING RULES OF THE SKUNK WORKS

8. The inspections system as currently used by the Skunk Works, which has been approved by both the Air Force and Navy, meets the intent of existing military requirements and should be used on new projects. Push more basic inspection responsibility back to subcontractors and vendors. Don’t duplicate so much inspection.

9. The contractor must be delegated the authority to test his final product in flight. He can and must test it in the initial stages. If he doesn’t, he rapidly loses his competency to design other vehicles.

10. The specifications applying to the hardware must be agreed to in advance of contracting. The Skunk Works practice of having a specification section stating clearly which important military specification items will not knowingly be complied with and reasons therefore is highly recommended.

11. Funding a program must be timely so that the contractor doesn’t have to keep running to the bank to support government projects.

12. There must be mutual trust between the military project organization and the contractor with very close cooperation and liaison on a day-to-day basis. This cuts down misunderstanding and correspondence to an absolute minimum.

13. Access by outsiders to the project and its personnel must be strictly controlled by security measures.

14. Because only a few people will be used in engineering and most other areas, ways must be provided to reward good performance by pay not based on the number of personnel supervised.
RULES AS APPLIED TO SOFTWARE ENGINEERING

1. SOFTWARE MANAGER ASSIGNED TO PROJECTS REPORTING DIRECTLY TO PROJECT MANAGEMENT - OVERSEES SUPPLIERS AND IN-HOUSE PERSONNEL.

3. AGGRESSIVE USE OF SMALL SOFTWARE ENGINEERING TEAMS

4. CAREFUL APPLICATION OF CONFIGURATION MANAGEMENT AND CHANGE CONTROL

5. DOCUMENTATION RESTRICTED BY "ESSENTIAL" CRITERIA. SIMPLIFIED FORMATTING WHERE APPROPRIATE

6. REGULAR METRICS COLLECTION AND ANALYSIS FOR MANAGING PROGRESS AGAINST SCHEDULE AND BUDGET.

7. FLOWDOWN OF BASIC RULES TO SUPPLIERS
8. TASK STREAMLINING - "VALUE-ADDED" CRITERIA APPLIED - NO DUPLICATION OF EFFORT

9. SOFTWARE DEVELOPMENT ORGANIZATION TESTS AND VERIFIES SOFTWARE IN LAB OR ON VEHICLE PRIOR TO TURNING IT OVER TO FORMAL INDEPENDENT TEST ORGANIZATION.

10. USE OF "INTENT" OF MIL-STDs RATHER THAN FULL CONFORMANCE. USE OF MIL-STDs NEGOTIATED WITH CUSTOMER UP FRONT.

12. END USER ENCOURAGED TO PARTICIPATE EARLY DURING DEVELOPMENT AND PROVIDE CRITIQUE AND FEEDBACK WHEN DECISIONS NEED TO BE MADE.
THE MISSION OF

LOCKHEED MARTIN SKUNK WORKS

TO SATISFY ANY NATIONAL NEED REQUIRING PROTOTYPING, OR SPECIALIZED TECHNOLOGY, TO PRODUCE A RAPIDLY REQUIRED SYSTEM OF LIMITED QUANTITY, TOTAL QUALITY, IN A QUICK, QUIET, AND COST EFFECTIVE MANNER USING ALL THE STRENGTHS OF THE CORPORATION