C-130 Production at Warner Robins ALC: Lean Change at a Crossroads

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Outline

- What is a C-130?
- Lean timeline in C-130 PDM
- Lean results in C-130
- Successes and Challenges

What is a C-130?

What is a C-130?

- First flight: 1954
- Entered service: 1955
- 11 models in service, most recent: C-130J, 1999
  - Up to 450 different configurations
  - 2,156 A/C of all models built since 1954
  - 800+ A/C in USAF, 600+ Foreign Govt
- Used by all Services, Forest Service, USCG, many foreign governments
- Missions: Cargo, Tanker, Electronic Warfare, Gunship
- PDM cycle determined by many factors, boiled down to # months

WR-ALC "North Star"

We Provide Combat Capabilities for DoD Warfighters and Our Allies Through Superior Sustainment and Deployment of Combat-Ready Forces

. . .Now and in the Future!

Effects-Based Capabilities for the Warfighter

C-130 Timeline

- July 01: Lean Change Agent designated
- 9-11: "Walking the Value Stream" for the first Lean Event
- Oct-Nov 01: Initial Cell Flow established
  - "Low-hanging fruit", simple value stream efforts

C-130 Timeline

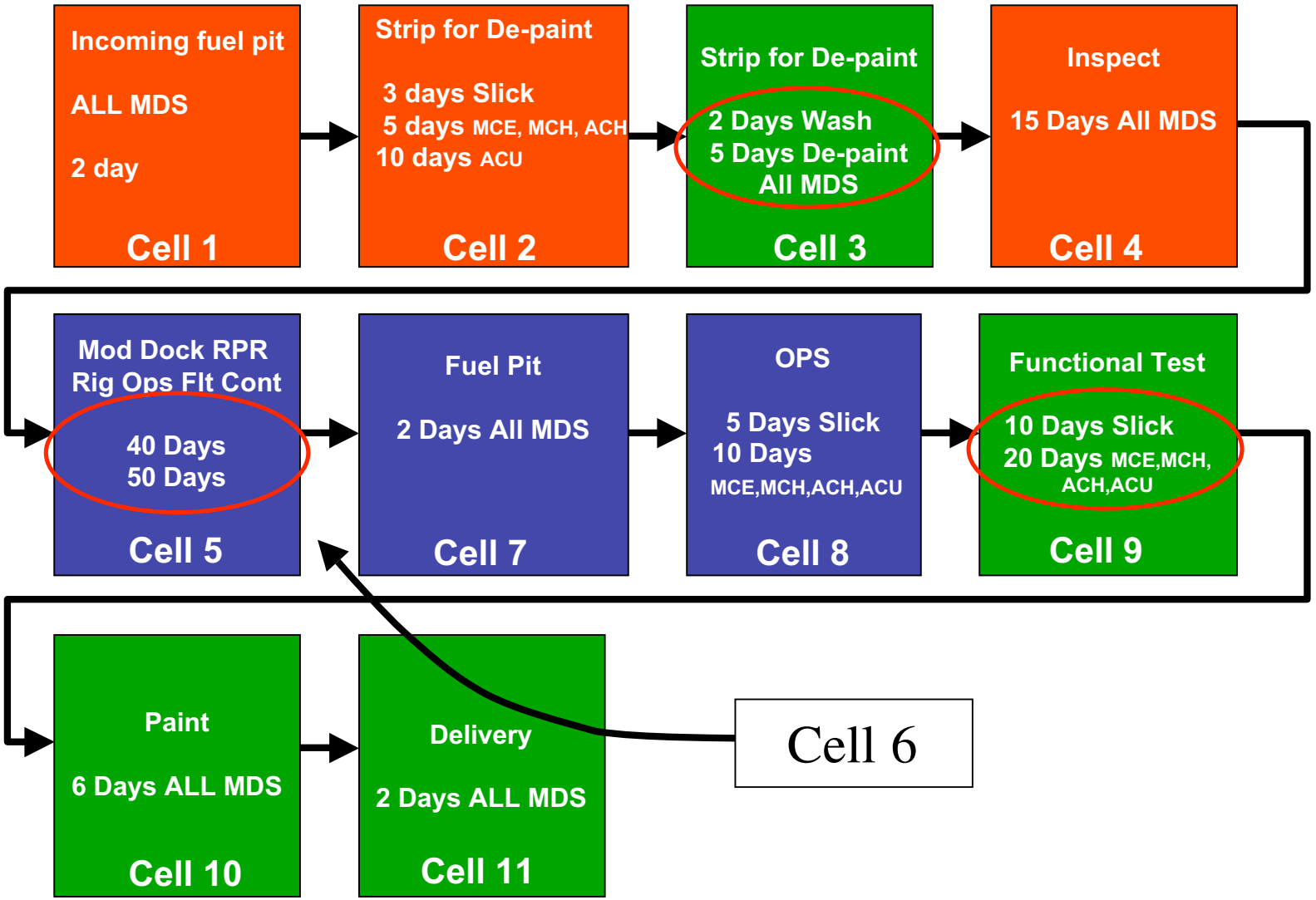
- **Feb 02: Lean Symposium in Atlanta**
  - **"The light went on"**
  - **"Make the General happy" to "Full bore Lean"**
- **Feb-Apr 02: Crash course in Lean**

"Crash Course"

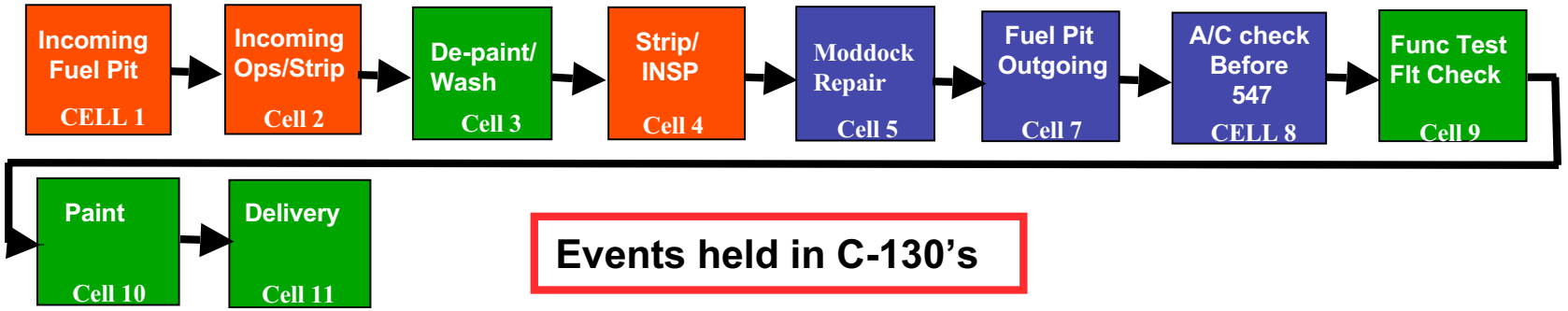
- Cellular flow on the Production Line
  - Organized/Reorganized 15K - 20K tasks and operations*
  - 10-12 people in 8 weeks
- Scope
  - 11 maintenance skills
  - 450 possible A/C configurations

*8,900 to 40,000 work hours for a PDM aircraft

C-130 Cells



C-130 Lean Events



Events held in C-130's

(1) VSA C-130 PRODUCTION
(4) VSA C-130 PRODUCTION
(8) Flt Line VSA
(12) VSA C-130 Production

PRE-DOCK

(2) 6S BLDG 50
(3) Bldg 50 Flt Cont
(19) C-2 SW
(22) C-2 6S

MOD-DOCKS

(5) 6S BLDG 91
(11) Phase 4 SW
(12) Phase 4 6S
(16) C-4 6S
(17) C-4 PCB
(18) C-4 SW
(19) C-5 SW
(20) C-5 T-2
(27) A/C W B
(28) C-5 T-3
(29) C-5 T-4
(30) C-5 T-6
(31) C-5 T-7
(32) C-5 T-8

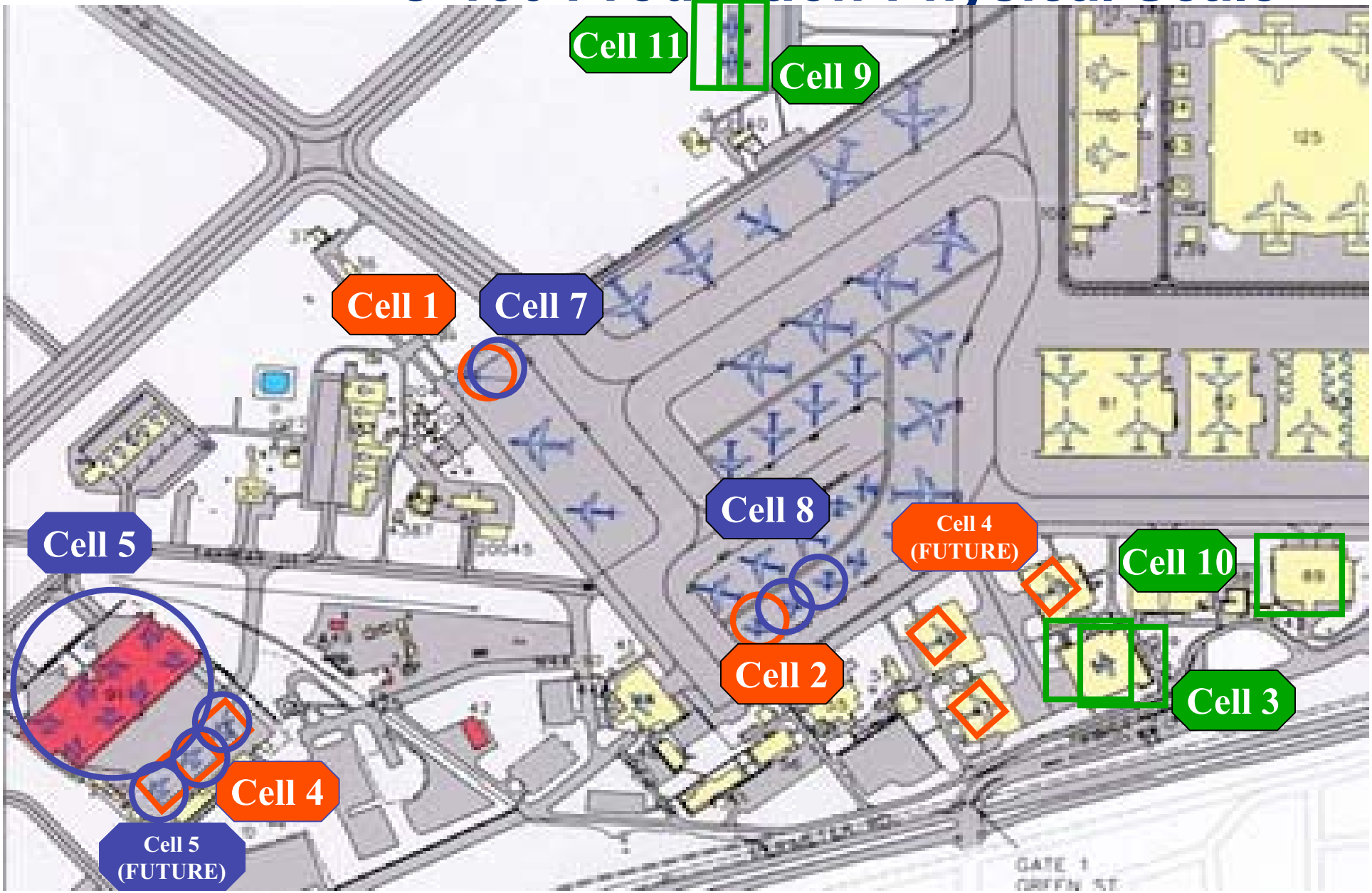
POST-DOCK

(13) SW FT
(10) 6S BLDG 89
(15) 89 F/U

SUPPORT

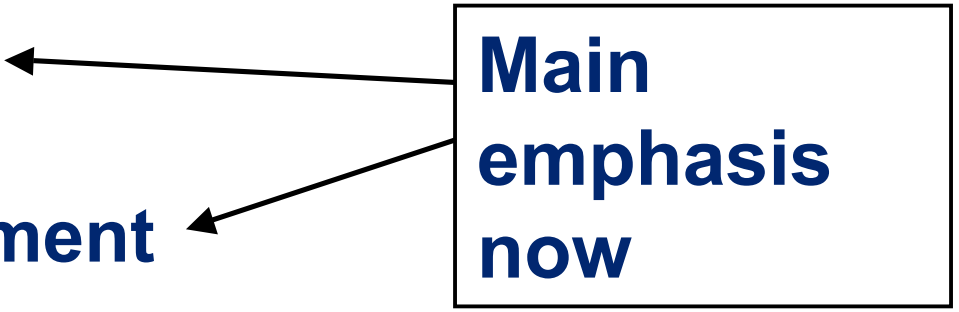
(23) SW FOM
(11) SW 103/107
(14) SW REWORK
(4) SW TOW/CRANE
(6) MIC Storage
(9) PMEL
(10) Kitting
(24) MRT
(25) VSA Supply Support
(26) FOM Transition Plan
(33) POU HAZ MAT

C-130 Production-Physical Scale



Sequence of Effort

- Established Cells and Flow: VSA/VSM
- 6S
- Standard Work
- Visual Management



Sequence of Effort

Aug 2001-Sep2002

- ***Value Stream Analysis***
- **Bldg 50 and 89 Events (Depaint/Paint)**
- **Functional Test**
- **Mod-Dock**

Sep 2002-Present

- **3P (People, Property, Process)**
- **Cell 4 *6S* and *Production Control Boards***
- ***Standard Work* – Cells 2, 4 and 5**
- **Cell 5 *6S* – T2, T3, T4 and T5**
- **FOM Event**

Future

- **Continue Cell 5 6S**
- **Workbook Standardization**
- **Transition to Bldgs 47, 48, 49**
- **Development of Sheet metal/Engine shops**
- **Develop parts disposition cell**

Lean Effort and Results

- Personnel:
  - July 2001: 1
  - Today: 10
- 47 Events
- 122 Projects
- 175 Do-its

- De-paint
  - 7 to 5 days…28% Reduction
- Functional Test
  - 15 to 13 days…14% Reduction
- Flight Controls
  - Savings: Over $5K per A/C
  - Est. annual savings: $288K (50 A/C)
- Paint Shop
  - Cut costs: $347,000 per year
  - Reduced flow time 50%

C-130 Results

- Point of Use for Tools, Consumables, Hazardous Materials:
  - Cut mechanic travel time by 50 hours/day
- Increased Aircraft Production
  - FY01: 32 PDM
  - FY03: 46 PDM…44% increase

Current Big Issue

- Internal vs. External rates of change
  - FY04 TAKT time goal: 52 PDM* (+13%)
  - Customer demands 64 for FY04 (*40% increase*)
- External demand surge highlights gaps in Lean implementation
- Short term vs. long term focus re: Lean

Working on Lean under war time demands

*52 A/C was the goal from the start of Lean effort: based on historical customer requirements

Keys to Success* in C-130 PDM

- Implementation Plan/Strategy
- Worker concerns
- Human Resources issues
- Organization and process mismatches

These initial insights warrant detailed research

*Often doubling as challenges

Tough Challenges

- **Rapid process change on Production Line leaves support processes challenged**
  - **Enterprise organization vs. Production process**
  - **Programming and Budgeting vs. Process/Work packages**
- **Metrics: Incentives vs. Expected behaviors**
  - **Budget performance metrics vs. 'ground truth' activities**
  - **Manpower transfer between organizations**
  - **Personnel/HR System vs. Production/Lean duties**

Early interview data supports these points

Initial Take-aways

- There are no surprises here
  - Change is hard
  - Persistence pays off
- Think through implementation plan
- Scale of an ALC
  - Attention to seams and interfaces critical
  - Enterprise - Institutional metrics key challenge

