INTEL – Chandler, AZ

http://www.youtube.com/watch?v=aWVywhzuHnQ

Microprocessors – “computer chips”
- Tiny, fragile (size of dime = 5.5 million transistors)
- Expensive! One small mistake could cost millions of dollars

Clean Rooms
- HEPA filters, temperature, humidity
- Bunny suits (hood, goggles, gloves, booties)
- Everything is white
Highly skilled workforce
Constant flow of information
Many quality checks throughout process
Team members have to constantly monitor lot progress, quality levels, machine performances
“Hot Lot” – Rush order of product that takes immediate priority (customer request, recovery for quality loss, etc)
Constant balance: keeping machines running while fitting in time for maintenance, calibration, cleaning.

Front line people can stop the line (the cost to manufacture scrap is extremely high)

There is little or no chance to ‘repair’ defective products (can downgrade).

Use of computers to monitor batch quality & show trends.
Intel

- Early production – manual dexterity
- Now – Highly automated – 2-yr degree req’d
- #1 Skill – Communication!
- Intel tries to give everybody as much information as possible (no more ‘only need to know’)
Attention to detail

Everyone MUST follow Standard Operating Procedures (SOP’s)
Harley-Davidson

- Kansas City, MO
- [http://www.youtube.com/watch?v=ThjYcG9H3Ys](http://www.youtube.com/watch?v=ThjYcG9H3Ys)

QUALITY – The product meets or exceeds the expectations & the needs of the customer.
  - Premium brand (customers expect the best)
  - Each cycle undergoes >200 quality checks
  - They even double-check work done by robots.
  - Quality Audit
    - An independent review versus standard
    - H–D selects a couple cycles each day for close scrutiny.
    - The audited cycles & the final score/report are parked in the center of the cafeteria each day.
Harley–Davidson

- **Union & Management Cooperation**
  - Two offices, top floor, separated by glass – plant mgr & union leaders
  - Total trust

- **Self–Managed work teams**
  - From the beginning – philosophy was to give decision making to frontline workers. Fosters ownership.
    - Manage their budget
    - Make work assignments
    - Ensure they meet deadlines
    - Interview potential team members
    - Must be willing to take on responsibility
  - **Source of most problems? COMMUNICATION**
Customization – the process of building products to meet the specific needs of individual customers/groups of customers.
- Three main types of motorcycles
- Each comes in a total of 900 variations
- Each bike includes a “traveler” (a specification list that travels with the cycle throughout the production process).
- Workers must continually check the traveler to ensure they are adding the right parts to the bike.

The motorcycle is assembled in about 43 minutes.
Union Carbide

- Hahnville, LA
- Chemical Plant – Butanol
- Highly automated with relatively few workers
- **EMPOWERMENT**
- Decreased number of mgmt, Increased worker responsibility & ownership
- Highly independent teams
  - Plan their own daily job assignments
  - Have a say in each other’s compensation
  - Manage their own budget
  - Use their own company credit card for needs
  - A lot of cross training
Union Carbide

- Safety mentality
  - Chemical plant – Many potential dangers
    - Flammables
    - High process temperatures
    - Ladders & stairs

- Manage the budget
  - Keep overtime low
  - Order their own supplies
  - As a result – employees are careful about costs
Union Carbide

- Performance Reviews & Feedback
  - Peer reviews
  - During review, no negative feedback can be given that has not already been discussed with the employee.
  - Feedback must be SPECIFIC to be useful

- Team Roles
  - Rotate roles
  - Builds personal skills in multiple areas
  - Encourage direct resolution of employee conflicts

- Empowerment Teams
  - Additional cross functional teams – quality, safety, customer service, etc.
American Licorice

- [Link](http://www.youtube.com/watch?v=AVAnYMVRmdI)
- Allsip, IL
- Company considered move to Mexico because mfg costs were not competitive.
- Decided to try to change the plant:
  - Teams
  - Increased worker responsibilities
  - Worked with the unions
Production workers began doing in-line quality checks routinely
  ◦ **SPECIFICATIONS** – a detailed description of the acceptable limits allowed for different aspects of a product or process.

They also began doing routine maintenance of production machines.

The transition from individuals to teamwork was challenging for many.
LEAN MANUFACTURING
- A system that identifies & eliminates all activities that do not add value to the product.
  - #1 – Leader Standard Work
  - #2 – Visual Controls
  - #3 – Daily Accountability Process
  - #4 – Leadership Discipline
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