Advanced Development Programs

What Does Industry Expect in New Grads?*

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* Excerpt of Original Content from Lee Nicolai, LM Fellow

What Does The Aerospace Industry Do?

- **Build aerospace products for fun and profit**

- **Build a product that is:**
  - **Better**
  - **Cheaper**
  - **Prettier or Friendlier**
  - **First in the Market Place**
    - **… Than the competition**

- **Research doesn't make much $$$**
  - **IRAD – Company funds**
  - **CRAD – Government 6.1, 6.2 funding levels**

    BUT
  Research leads to technologies that out perform competition

What Does Industry Expect In New Grads?

- **Evidence of professional and ethical behavior**

- **Solid understanding of engineering fundamentals**

- **Ability to work and be comfortable with "Open Ended" problems**

- **Solid understanding of design**

- **Good communication and team working skills**

- **Passion for the possible**

Evidence of Professional and Ethical Behavior

- **NUMERO UNO**

- **If you don't have this … GO AWAY!**

- **The company cannot afford unprofessional or unethical behavior**

- **We don't want another**
  - **ENRON**
  - **TYCO**
  - **Past examples in Aerospace**

- **Advice: You will probably need to get a security clearance … So don't do drugs, DUI, fraud, abuse, harass, default on debts and other naughty stuff**

Solid Understanding of Science/Engineering Fundamentals

$$F = ma$$

- **Self evident**

- **The company cannot afford mistakes**
  - **Lead Engineer cannot check everything**
  - **A mistake can kill somebody … or worse yet – lose money**

- **Do a BOEA (Back of the Envelope Analysis) before turning on computer**
  - **Show understanding of computer code**
  - **Scope out the critical part of the design space**
  - **Develop inputs and boundary conditions**
  - **Define the character and size of the computer results**

- **Work hard to establish your technical credentials**
  - **Credibility leads to Promotion … both as an engineer and manager**

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Ability To Work and Be Comfortable With Open Ended Problems

- **Industry does not have any Closed Form problems**
  - There are no "right" answers … only a best answer at a point in time

- **Must be able to "flip-flop" your brain**
  - Left Brain – Deductive Analytical, Rational
  - Right Brain – Creative, Irrational

- **Life in Industry**
  - Your problems will never be properly posed
  - You will have to develop the criteria (left)
  - You will have to make assumptions (right)
  - You will have to examine the solution space (right)
  - You will have to analyze the many possible solutions (left)
  - You will have to select from many possible solutions (left)
  - Your career progression depends on your selection

Solid Understanding of Design

- *Create Something That Never Was*

- Question the requirements and Identify the MoM
  - The requirements are often flawed
  - MoM – What the customer "really" wants

- Remember … it is not a design if it can't be built
  - Must understand manufacturing processes
  - Keep It Simple
  - Must be affordable

- The design needs to have a
  - Multi-disciplinary , systems perspective and customer focus

- Ability to flip your brain is a good indicator of your design capability
  - GPA is not a good indicator of this

Good Communication and Team Working Skills

- **You must be able to**

  Write Well   **Express Well**

  Present Well   **Listen Well**

  Work Well   **Adapt Well**

- **Building an aerospace product is a Team Sport**

Passion for the Possible

Innovate to Realize Grand Challenges

Bottom Line For New Grad Entering Industry

UNDERSTAND THAT YOU ARE

- **Leaving an environment that**

  – **Educates students**
  – **Advances science**

- **And entering an environment that**

  – **Makes products**
  – **Sells for a profit**