Managing the Talent Challenge

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Agenda

- Numbers We Cannot Ignore
- Reflecting on Industry Events
- Workforce Overview
- Survey Results
- Proactive Steps
Workers are getting older
- By 2010, one in three U.S. workers will be age 50 or older
- Utility executives estimate ½ of the technical workforce will reach retirement age in 5 – 10 years
- At 50+, utility craft workers have highest average age of any industry

Demand is increasing
- In 2015, a 15% decline of ages 35 – 44; demand increases 25%
- 2010 demand for U.S. electrical engineers in construction will be up from 150,000 today to 175,000

Supply is decreasing
- Reduction in graduating engineers during the past 15 years
- Decrease in power engineering graduates
Reflecting Upon Industry Events

- Price Spikes
- Mergers Galore!
- Big, Bad Outages
- Are Lights on in CA?
- ENRON Started It
- Sarbanes Oxley
- It is BLACK-Out!

- Generation Boom, Price Bust, Credit Crunch
- Cost Cutting: Increased System Utilization
- Fix It or Else! Re-gain Confidence
- Regulator Unknowns
  - FERC Pursues Std Market Design, RTOs
- Stocks Plummet
  - Focus on Core: Manage Short Term EPS
- Financial Focus: Ensure Compliance
- Standards and Infrastructure Interest
Power Industry Workforce Overview

- Historic financial and plant focus: intellectual set aside
- Knowledge is leaving: average age is increasing

Typical Electric Utility Employee Age Distribution

![Graph showing employee age distribution over time](image)
Infrastructure Needs and Expertise Impact

Emerging needs
- Increased maintenance
- Adaptation of technology
- Integration of new with old
- Increased spending
- Increased environmental and political interests

Will experience to do basic utility work be available?
Will infrastructure be available to attract and train enough talent?
Survey Participation and Approach

- Survey performed in Fall 2004 - Spring 2006
  - Approximately 30 utilities participated
  - Targeted power delivery in USA and Canadian

- Gathered workforce trends
  - Average age & retirement trends
  - Succession planning
  - Adequacy of hiring pool
  - Five-year availability

- Identify best practices for course correction
Average Age & Retirement

- **Average age**
  - Ranged from 43 to 48
  - Overall average 45.7
  - Similar results from craft, management, and technical

- **Forecasted retirements**
  - Averaged 20% in next five year
  - Responses varied greatly
  - Some models are created
    - Age-based forecasts
    - Largest motivator is stock price
Estimated Five-Year Technical Gap

Workforce Challenge and Potential Solutions

- Existing technical talent: 20%
- Workforce demand increase: -20%
- Exits for retirement: -10%
- Fill management positions & loss to others: 50%
- Technology and productivity: 10%
- Retirees continue to work: 5%
- Outsource and utilize international supply: 5%
- Hire: 30%

Potential solutions
Succession Planning

- **Senior management**
  - Extensive

- **Middle management**
  - Planning is growing
  - Approximately $\frac{2}{3}$ complete

- **Key technical**
  - Isolated activity to date
  - Critical skills being identified

- **Hiring pool**
  - Some difficulty in finding experienced technical skills
  - Anticipate more difficulty in the future
Five-Year Availability

- Demand may increase for:
  - Middle career engineers
  - Senior engineers
  - First-line management
  - Senior management

- Talent shortage prediction:
  - Middle career technical talent
  - Senior career technical talent
Knowledge Transfer

- All are concerned about the ability to transfer knowledge

  Comments:
  - Fledging knowledge management activities are underway
  - Yet to pursue full-blown knowledge transfer
  - Intention is to hire above core staff levels for transition
  - It takes money to have two people in one job!
  - Retirees will be a source of temporary labor as needed

- All are using e-learning to some extent

  Comments:
  - Applications vary
  - Very limited. Want to go in that direction
  - Offering operator, FERC compliance training and some classes for supervisory and leadership
Relations and Image

- Image perceived to be old fashioned
- Comments:
  - Publicity needed
- Industry organizations can help improve preparedness
  - Communication with schools
  - Awareness as a national concern
  - Alert regulators to factor into decisions: training, development costs, recruiting
Most are building relations with colleges and craft schools

Comments:
- Engineering, technologists, and apprenticeship programs jointly developed
- Leaders are on boards
- Collaborative e-learning development
- Ongoing scholarships
Utilize Critical Skills to Target Efforts

- Most have defined critical skills or knowledge sets
- Critical skills included:

**Soft Skills**
- Broad business understanding
- Financial understanding
- Interpersonal skills
- Strategic thinking and planning
- Development
- Communications
- Decision making
- Curiosity
- Emotional IQ
- Learning Agility

**Experience / Technical Skills**
- Power Dispatcher
- System Operator
- Relay Technician
- Underground Technician
- Transmission Expertise
- System Planning Engineering Roles
- Design Engineer
- Electric Service Line Workers
Knowledge Retention Planning

- TVA Created Integrated Workforce Plan in 1998
  - Implemented Attrition Survey – Just Ask!
  - Recruiting, Training, Coop / Intern Program
  - Standard Processes and Procedures
  - Cross Organization Peer Team for processes, standards, staffing

- Results
  - Successful recruiting
  - Minimal forced reductions
  - Integrated into business planning
  - Knowledge Loss Risk Assessments with 2600 employees
Knowledge Retention

- **Step 1. Conduct a Knowledge Loss Risk Assessment**
  A. Assign 1 – 5 for anticipated retirement: ‘5’ in current year, ‘1’ in 6+ years
  B. Assign 1 – 5 for difficulty to replace: ‘5’ mission critical, ‘1’ common
  C. “A” x “B” = “C” or Attrition Factor: 25 is high priority with immediate action

- **Step 2. Determine Approach** to Capture Knowledge
  - Conduct interviews
  - Assess consequence of loss
  - Develop plans
    - Codification
    - Engineer it Out
    - Education and Training
    - Alternative Resources

- **Step 3. Monitor and Evaluate**

**Lessons:**
- Less at risk than suspected
- Greatest risk in specialized technical positions and problem solving
- Re-design opportunities emerge
- Current procedures are sometimes weak.

*Best Practice*
Changing Needs and Expectations

Baby Boomers
- 20+ years experience
- Comfortable with print
- Well established networks
- Take work seriously
- Loyal, employed for life
- Serve as mentors
- Less diverse

Generation X
- Upwardly mobile
- Computer savvy
- Prefer on-line media
- Strive for life-balance
- Expect job shifts, training
- Varying needs, flex time
- More diverse
Technology for Knowledge Retention

Device Control & Data Gathering

- SCADA
  - Residential Load Control
- Distribution Automation
- Automated Meter Reading

Communication and Computing Evolution & Information Developing

- Geographic Info
- Customer Systems
- Reliability Focus
- Dist. Management Systems
- Trending

Information Integration, Web, Process / Technology Linkage to Get More for Less, Rapid Change

Technology facilitates knowledge transfer, training and efficiency
Students in Science and Engineering

- 50% of workforce is women

- In the U.S. women are:
  - 11% of engineering workforce
  - 20% of the undergraduate engineering degrees

- U.S. engineering enrollment
  - Women enrollment is steady
  - Men enrollment is declining

Opportunity exists to attract more talent
Increasing the Scientific Pool

- Involve students in ‘doing science’ prior to grade 9
- Provide opportunities to perceive career options
- Encourage taking all math available in high school
- Provide role model engineering professionals

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Support efforts to improve awareness and image
Power Engineering Academic Status

Inside USA

- Retirements outpacing new professor hires
  - Average age increasing
  - Power faculties have ~3 professors

- Viable programs are down

- Students
  - Attracted to other areas
  - Many are international

Outside USA

- New professor hires outpace retirements
  - Power faculties have ~10 professors

- Growing enrollment

- Students
  - Positive image
  - Potential provider for U.S. needs

Work with academia to revitalize educational infrastructure
Prepare for Training

- **Increasing training demand**
  - Engineers will not have power backgrounds
  - Retirees will exit before tribal knowledge can be transferred

- **Increasing need for training investment**
  - Budget training at approximately 2% of payroll
  - Set a ratio of training to employees ie 1:300
  - Allocate formal training hours for ie 40 per year

- **Unique approaches**
  - Maintain a “chief” to coach and mentor
  - Utilize suppliers for training
  - Arrange corporate university programs
  - Re-invest in power and trades educational development
  - Develop e-training focusing on practical application
Brand while Creating Pipeline

- **Power Careers**… where students:
  - Are Nominated by high school faculty
  - Enroll in 2-year degree for power plant operations
  - Apply for $1000 scholarship and work part time

- **Future for Kids Partnership** (www.f4k.org) … includes:
  - Partner with non-profit organizations
  - Use web portals aimed at high school students
  - Offer assessment tools for students on-line

- **Boys and Girls Clubs Partnership** … approached by:
  - Assess students interests and aptitudes
  - Target job shadowing opportunities where there is a match

Recruit and hire for the long-term
Challenges

- Significant forecasted attrition
- Increasing workload
- Declining expertise and practical knowledge
- Limited workforce pipeline
- Declining academic and training infrastructure
- Challenges from international reliance
- Suffering industry image
- Shifting to address long-term needs
Implications for Supply Chain

Shrinking Workforce and Decreasing Expertise

- Workforce availability and capability
- Total life-cycle cost decisions
- Increased diversity
- Ability to get technical support and services
- Non-traditional outsourcing
- Long term relationships
- Domestic v.s. international sourcing implication
Recommended Actions

- Create a workforce plan
- Implement succession planning
- Extend selected individuals as a ‘chief’ to mentor
- Utilize technology
- Monitor hiring pool adequacy
- Position for more diversity
- Establish relationships with schools
- Migrate to e-learning and formalized training
- Support efforts to provide practical knowledge
- Promote industry image
- Incorporate trends into procurement considerations