The Abdus Salam International Centre for Theoretical Physics

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Joint ICTP-IAEA School of Nuclear Knowledge Management

1 - 5 September 2008

Human Resource Challenges to Knowledge Management

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Human Resource Challenges to Knowledge Management

School of Nuclear Knowledge Management
Trieste, Italy
September 2008

Presentation by Ed Boyles

IAEA
International Atomic Energy Agency

Content

- **HR Challenges to KM**
  - Strategic Work Force Planning
  - Recruiting the next generation
  - Training & Development new employees to full competency (Filling the gap)
  - Selecting the right people for leadership positions
  - Retaining top talent
- **HR Solutions**
  - Same as above

Management of human resources

- Key Issues from counterparts:
  - Role and mission of personnel management services
  - Approach to integrated management of human resources; - aspects and techniques of recruitment, training, assessment, qualification, authorization, motivation and development of NPP personnel
  - Methods of defining future staffing requirements
  - Methods and stages of staff recruitment
  - Creation of positive employer image – Branding
  - Attracting young personnel to the organization
  - Assessment of recruitment effectiveness
  - Ownership and responsibilities of managers for competence and training of the personnel
  - Management competence (How to evaluate and develop competent managers)
  - **Knowledge Management (KM) - overall concept of KM - ageing of personnel - KM practices including capture, preservation and transfer of knowledge**

Strategic Work Force Planning

- Through out the 1990's for most utilities - a tactical effort to balance the labor budget and headcount
- Little strategic planning occurred
- HR Organization (Personnel Services) was not involved attrition management or work force planning strategies
- Only recently have more utilities have begun to develop strategic and integrated work force strategies - driven by the loss of experienced staff – primarily through retirements

Development of the WFP System

- TVA developed the Integrated Staffing Plan in 1998
- Formed a Work Force Planning Group (1999) to implement the strategic planning process - Goals were to:
  - Develop long term plans that addressed future staffing demands
  - Integrate Work Force Planning with other related processes (Training, Recruiting, etc.)
  - Include Staffing Plans in Annual Business Plan
- IT tools and reports were developed to support the WFP
- *The Knowledge Retention Process was a key element of the WFP System*

Integrated Staffing Plan Model

Work Force Planning is the Key to an integrated Work Force Strategy

- Employee Demographics
- Attrition Data (Management & Employee Input)
- Staffing resource demands
- Emerging work
- New build plans
- Labor Cost
- Staffing Benchmarks
- Process Improvements

WFP Considerations

- Collection and analysis of accurate *attrition* information

- Current and emerging skills/competency needs
  - Improvements in processes
  - Improvements in equipment and technology

- Current and future work activities
  - Major modifications upcoming
  - New build planned
  - Decommissioning

WFP Considerations

- Long term staffing plans - 3 to 5 years
  - Operations and Maintenance pipeline
  - University Recruitment
  - Experienced hires
  - Retention actions for current employees

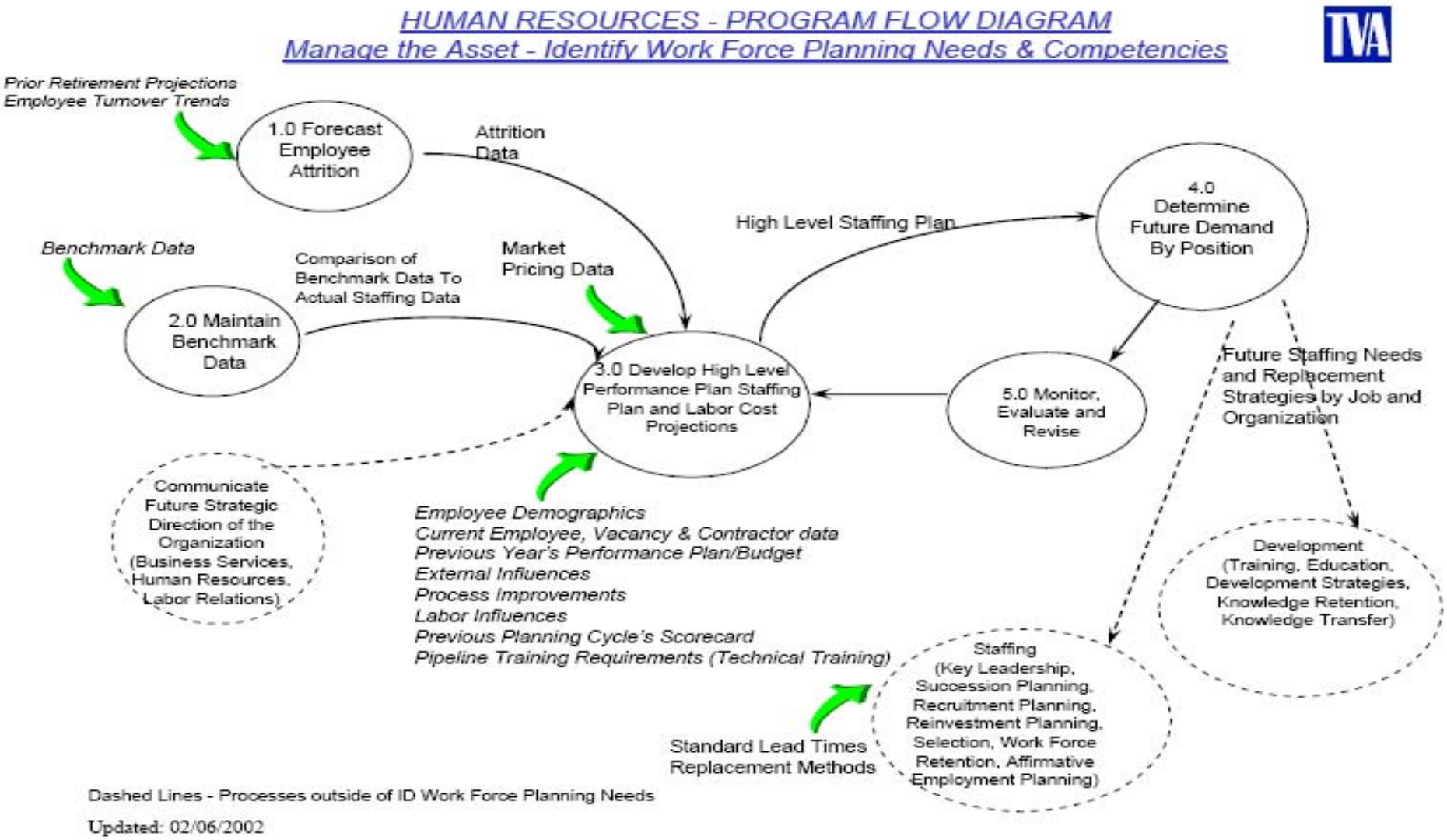
- Include in the organizations annual Business Plans (budgeted)

- Monitor, Measure and Update

Elements of Effective WFP Process

1. Compile Staffing Demographics
   - Forecast Pending Attrition
2. Develop Staffing Benchmarks
   - Compare against best performing plants
   - Understand plant specific demands
3. Develop high level staffing plans
   - Budget based
   - Confirmed by senior management
4. Develop detailed staffing plans
   - Department level plans
   - Identify need by position
5. Monitor, update and adjust

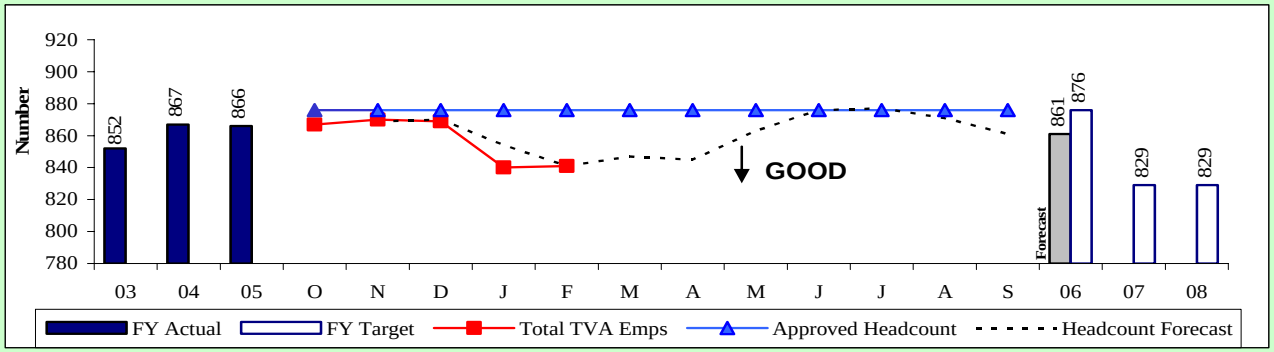
TVA's 5 Step WFP Process



Work Force Planning Metrics

Fiscal Year 2006
TVAN

Indicator: TVA Employees - Sequoyah
February 2006



Headcount	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	07	08
Actual Permanent Emps	867	870	869	840	841	0	0	0	0	0	0	0		
Actual TempTenure Emps	0	0	0	0	0	0	0	0	0	0	0	0		
Total TVA Emps	**867**	**870**	**869**	**840**	**841**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
Approved Headcount	**876**	**876**	**876**	**876**	**876**	**876**	**876**	**876**	**876**	**876**	**876**	**876**	**829**	**829**
Variance to Approved FC	**9**	**6**	**7**	**36**	**35**	**876**	**876**	**876**	**876**	**876**	**876**	**876**		

Numbers left of the bold line are actual. Numbers right of the bold line are projected.

Attrition/Replacement	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Retirements	4	0	1	23	2	2	2	3	4	2	6	10	59
Other Attrition	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfers to Other Orgs	0	0	2	2	2	0	0	0	0	0	0	0	6
Total Attrition	**4**	**0**	**3**	**25**	**4**	**2**	**2**	**3**	**4**	**2**	**6**	**10**	**65**
New Hires/Rehires	5	2	0	2	4	8	0	21	17	3	0	0	62
Transfers from Other Orgs	0	1	3	1	1	0	0	0	0	0	0	0	6
Total Replacements	**5**	**3**	**3**	**3**	**5**	**8**	**0**	**21**	**17**	**3**	**0**	**0**	**68**
Headcount Forecast	n/a	869	870	854	841	847	845	863	876	877	871	861	
Variance to Approved FC	n/a	7	6	22	35	29	31	13	0	-1	5	15	
FYTD Replacement %	125%	200%	157%	44%	53%	71%	68%	112%	138%	139%	124%	105%	

DEFINITION:
Total TVA employees includes part time employees.
Attrition and replacement counts are for permanent employees only.
Replacement % is the total permanent replacement YTD divided by the total attrition of permanent employees YTD.

Printed: 4/21/2008

SPONSOR: H. K. Fogleman
CONTACT: A. K. Hamala, 2682-C

PROBLEM AREA
* AFI - Succession Planning

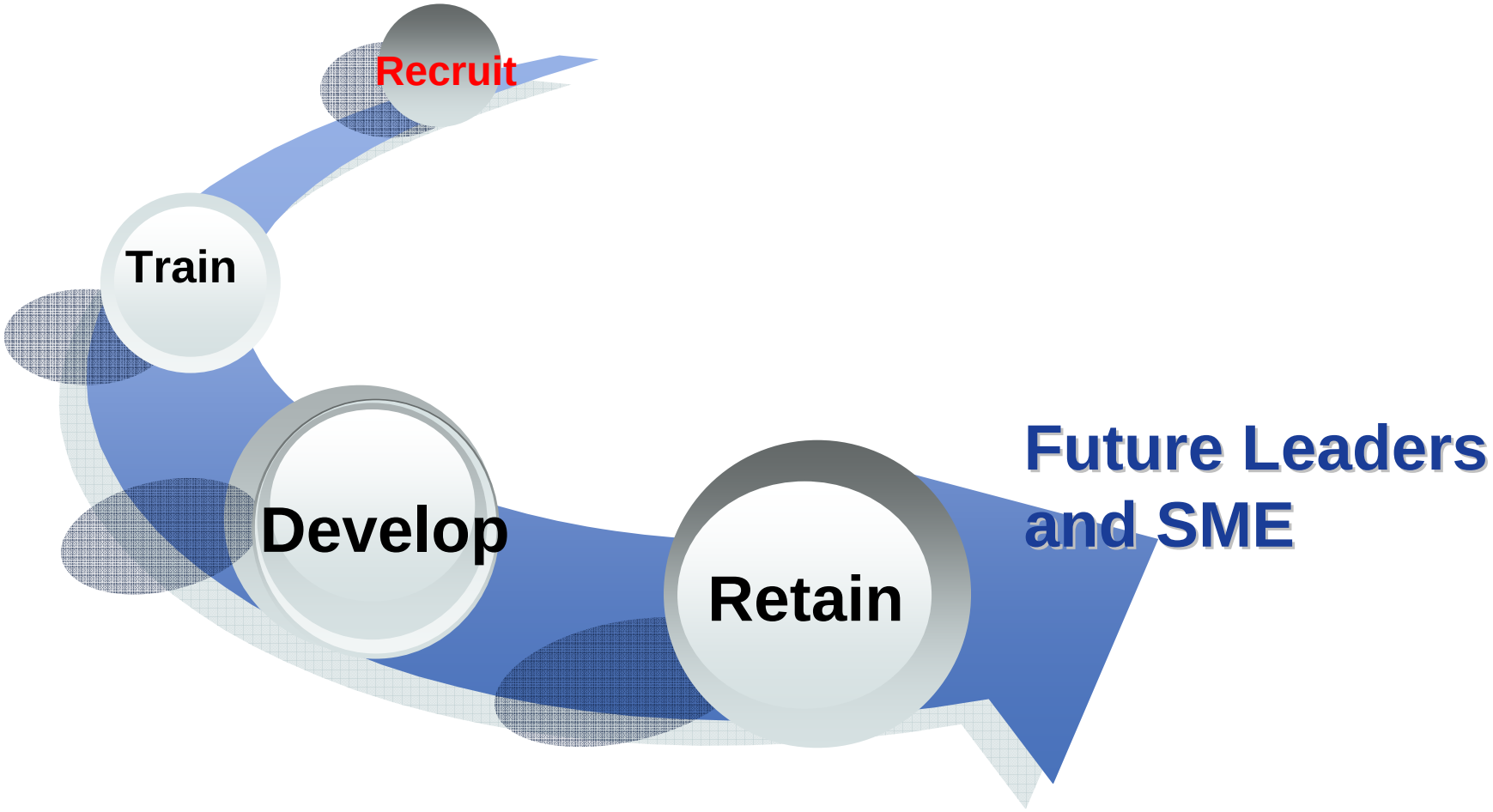
IMPROVEMENT ACTION PLANS	DUE DATE
Strategic Talent Mgmt	
Update STM ratings	5/26/2006
FY06 Upcoming Classes	
I&C Tech (14)	Feb-06
SGPO (20)	May-06
On-going Classes	
Mech Tech (13)	Jul-06
Elect Tech (12)	Jul-06
I&C Tech (9)	Jul-07
SGPO (16)	Sep-06

Knowledge Retention High Priority (20-25)	3
Knowledge Retention Position Risk (5)	4

Diversity Hires	22%

BASIS
TVAN FY 2006 Performance Plan Staffing Plan

Recruiting the next generation



Recruiting Challenge

Recruiting the next generation

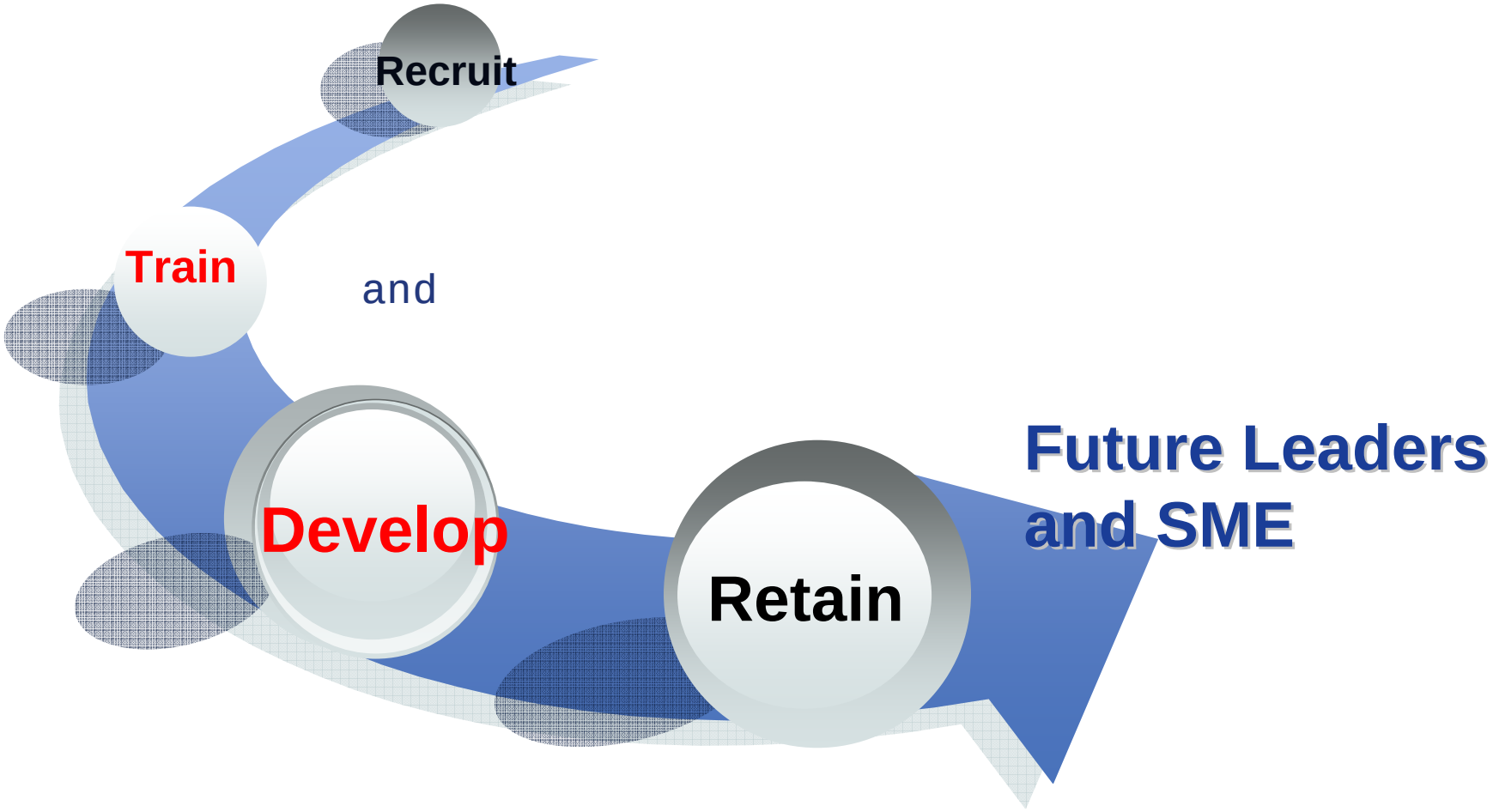
Recruiting Challenges

- Competition for talent (both entry level and experienced)
- Some students see nuclear as an “old technology” – They want to be IT specialist
- Our industry has high degree of qualifications needed - Multiple hurdle selection processes are lengthy
- Identifying enough qualified candidates who can successfully pass each hurdle

Recruiting Tools

- Websites
- Energy/specialized websites
- Print media (newspapers)
- Universities (career fairs)
  - Universities and community colleges
- Networking at conferences/meetings
- External recruiting firms
- Employee referrals
- Positive branding of company

Training and Development



Engineering Graduate Progression

Tennessee Valley Authority

Engineering
Graduate
Progression
Program

Making the Best Better!

Revision 2 - September 1, 2005

EGPP

Engineering Graduate Progression

Engineering Levels at TVA

(All are Represented by Union)

- Engineer Level – A (Entry to 4+ years)
- Engineer Level – B (Fully Qualified)
- Engineer Level – C (Team Lead)
- Engineer Level – D (Technical Specialist)

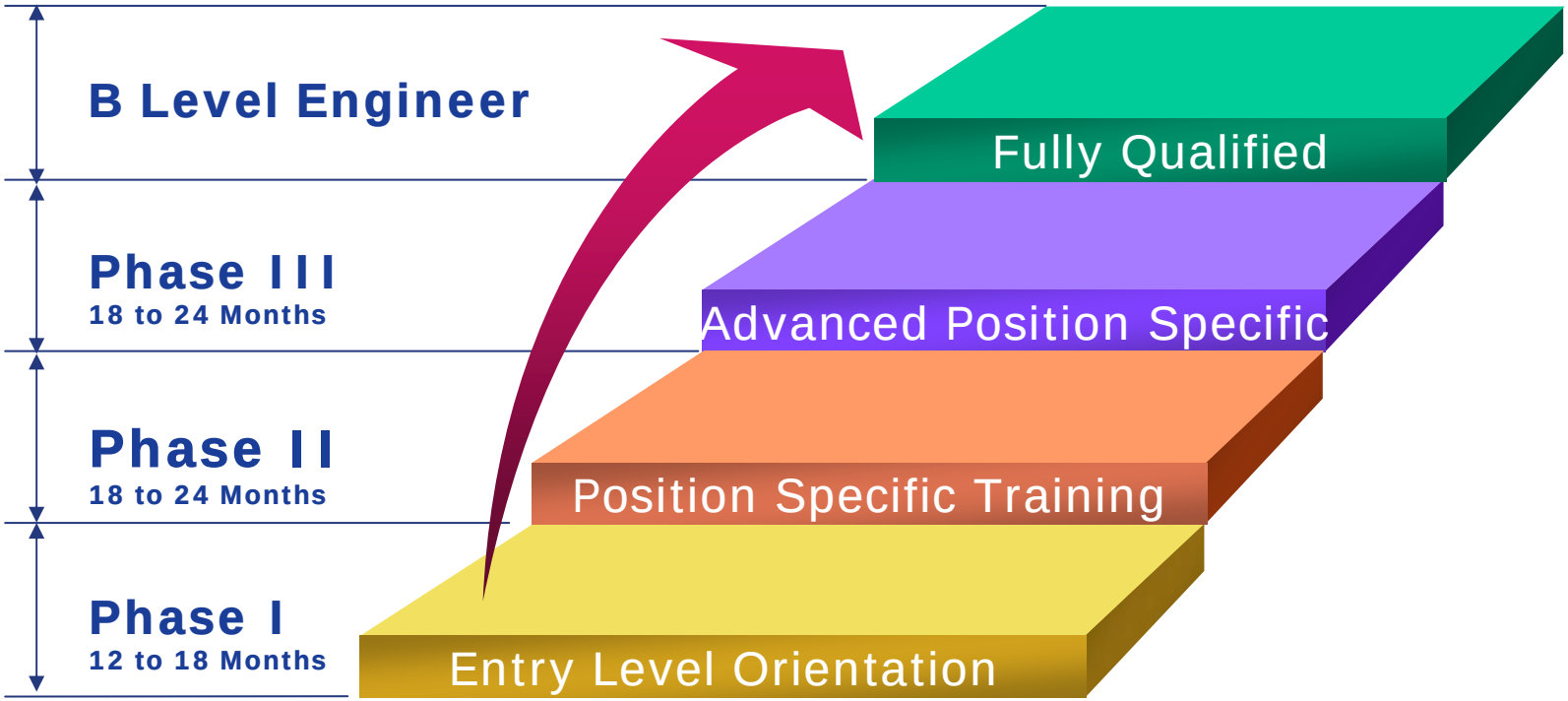
Engineering Graduate Progression

- **Designed to address the need to develop TVA graduate engineers to become fully qualified <u>as soon as possible</u>**

- **A combination of training and required work assignments**
  - Formal Training (Class Room Setting)
  - On line (CBT)
  - Informal Mentoring
  - "On the job" training
  - Demonstrated competencies

- **A clear road map that allows entry level engineers to progress in knowledge, skills, and experience in order to become fully qualified engineers**

Engineering Graduate Progression



EGPP - Key Elements

- **Mentors** - Assumes the role of sponsor, teacher, and counselor
- **Technical Experts** - Assist the graduate in performing specific technical assignments. These experts may change based on the specific assignments. They are intended to provide the detail direction on the technical, procedural and site requirements
- **Individual Development Plans** - Develop a detailed Individual Progression Plan (IPP - Specific to each Engineering organization)
- **Engineering Review Board** – Approves all reclassification to B level (fully competent)

Engineering Graduate Progression

TVA Engineering Graduate Progression Plan (EGPP) Model

Appendix A

Engineer - Level A			Engineer - Level B
Eligible for annual increases and EA Off-Cycle Pay Adjustments			**Reclassification to Level B**
Phase I (12-18 Months)	**Phase II (18-24 Months)**	**Phase III (18-24 Months)**	**Approval by Engineering Review Board**
TVA ORIENTATION AND INITIAL ENGINEERING ACTIVITIES e.g. New Employee Experience STAR 7 Technical Administrative Training: e.g. Health & Safety Environmental Business Processes Work Management Systems Technical Fundamentals: e.g. Systems Training Developmental Work Assignments Mentor Assigned	**POSITION SPECIFIC-DISCIPLINE ACTIVITIES** e.g. Root Cause Analysis Regulatory Project Support System Analysis Qualification Cards On-the-Job Training Developmental Work Assignments	**ADVANCED POSITION SPECIFIC QUALIFICATIONS AND DEMONSTRATED PROFICIENCY** e.g. Advanced Regulatory Projects Systems Analysis Advanced Qualification Cards In-depth On-the-Job Training Developmental Work Assignments	Phase I, II & III Training complete Qualification Requirements Met Fully competent engineer by demonstrated proficiency, (e.g. Achievement of PE license) Minimum 4 years of experience

OPA *OPA* *RECLASS*

PHASE 1	**PHASE 2*	**PHASE 3*	**Reclassify to Engineer*
A - LEVEL Entry Rate	*A-LEVEL*	*A-LEVEL*	*B-LEVEL*
80 - 100%	*95 -110%*	*100 -120%*	*80-100%*
min - max	*min - max*	*min - max*	*min - max*

Selecting Leaders

9 Box

TVA's program to assess and development top *management* talent

Key Components

- Managers are assessed on ***Performance*** and ***Leadership*** Potential using “Nine-Box” Model
- Regular reviews and discussions occur among executives and senior managers
- Strengths and development needs are openly discussed
- “Ready Now” and “Ready Long Term” succession candidates are identified for key positions
- Greatest investment in developing top talent

9-Box Template

Leadership Potential

Performance

1: High Performance/High Potential	3: High Performance/Medium Potential	6: High Performance/Low Potential
2: Medium Performance/High Potential	5: Medium Performance/Medium Potential	8: Medium Performance/Low Potential
4: New in Position (No longer than 6 mos.)	7: Low Performance/Medium Potential	9: Low Performance/Low Potential

Expectations: 9-Box Model

- The 9-Box model involves rating the Performance and Leadership Potential
- Initial ratings should be made by the immediate - should be discussed and revised, as necessary, as they are rolled-up the organization.
- Individuals in Box 4 (New in Position) 3-6 months
- Focus is given to development of top third individuals and performance improvement planning with low performers.
- Managers should provide all employees with feedback on performance and potential.
- Development Plans and Performance Improvement Plans should be developed and tracked

9-Box Performance Definitions

High Performance "Exceptional Performer"

- Exceeds most goals – especially those of high priority.
- Clearly delivers results to lead TVA in outperforming the competition.
- Consistently performs at the highest level.
- Is fully committed to and "lives" all of TVA's competencies. Leads by example, and is consistently regarded by peers and supervisors as a role model in all areas of behaviors.
- Always seeks to incorporate ideas and views of others. Is sought out by others to provide advice, to lead teams, and to champion change. Sets an example for everyone in executing strategies.
- Always takes opportunity to be accountable. Highly adaptable to new skills, behaviors, and information. Clearly understands unit's strategy and actively contributes to reshaping agenda.
- Develops and leads direct reports to achieve results. Creates and communicates a compelling vision and a strategy for meeting the vision.

Medium Performance "Significant Contributor"

- Achieves all goals, at a minimum, and may even exceed some.
- Delivers results to help TVA outperform the competition.
- Takes on extra projects and/or tasks without defaulting on basic objectives and responsibilities.
- Abides by the TVA competencies and is effective, but has room to improve behavior. Sets a uniformly good behavioral example for others. Understands other's views and ideas.
- Provides sound advice. Leads team with collaborative and committed spirit. Constructively challenges teams.
- Comfortable and responsive in new situations and when faced with new information. Demonstrates clear understanding of, and can be relied on to execute, strategies. Is committed to TVA's strategy and proactively seeks advice when needed.
- Proactively seeks feedback and acts upon it to improve capabilities and performance.
- Manages direct reports to achieve results. Is effective in communicating expectations to team members.

Low Performance "Does Not Meet Expectations"

- Does not achieve expected results; does not achieve high-priority goals, or does not achieve over half of total goals.
- Consistently ignores or conflicts with one or more of the TVA competencies. Behaviors need focused attention.
- Does *not* consistently demonstrate understanding of other's views and ideas, contribute to teams, work well in ambiguous situations, and/or understand TVA's strategies.
- Usually needs significant guidance to achieve results.
- Does not focus on developing direct reports. Lacks ability to effectively communicate vision and strategy.

9-Box Leadership Potential Definitions

High Leadership Potential

- Strong learning agility, i.e., curious, open to learning and able to learn quickly from experience.
- Thinks conceptually, strategically and maintains a broad perspective
- Exhibits a strong internal drive to have impact on the business and see results; shows a bias toward focused action
- Exerts positive, wide spread influence across the organization; communicates in an articulate manner, treats others with appreciation, respect and dignity
- Adapts easily to new, ambiguous or changing conditions; maintains realistic optimism and effectively leads change
- Holds self and others to high expectations; is a model for personal accountability, and is effective in driving accountability in others
- A role model for honesty and integrity, with a capacity for personal humility
- Interested in and capable of moving up one level immediately and another level in the near future. Could move within *or* across business units
- Limitations can be addressed by experience and/or targeted development

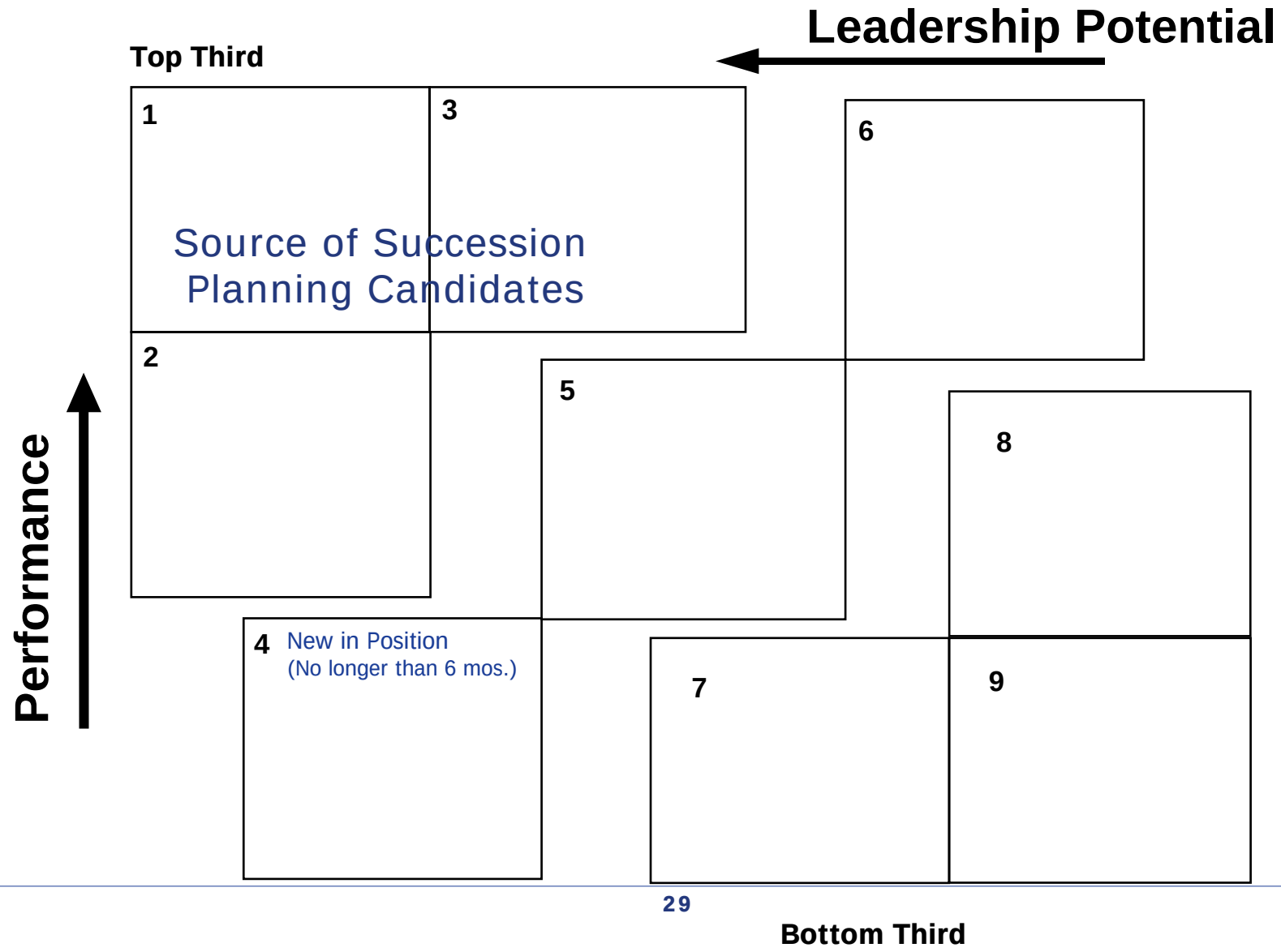
Medium Leadership Potential

- Moderate learning agility and adaptability to new or changing conditions; able to make decisions in ambiguous situations
- Demonstrates some knowledge of the big picture, but may have difficulty in maintaining a broad perspective
- Demonstrates many of the leadership competencies beyond current role and responsibility, however, some limitations in leadership style and approach need to be addressed
- Has potential to take on greater roles within the company. Could move up one level within the business unit in the short-term future or assume significantly greater responsibilities within current level.

Low Leadership Potential

- Not an agile learner; does not always learn from mistakes and has tendency to make errors.
- Clearly indicates significant limitations in leadership abilities
- Has difficulty with new or changing conditions; unable to make quality decisions in ambiguous situations
- Does not exert positive, widespread influence across the organization
- Does not manage through others to drive accountability through the organization
- Cannot maintain a broad perspective; operates from a more narrow, tactical or functional view versus broad and strategic
- May not be capable of progressing to the next level or to take on greater roles within the company; retention contingent on performance and unique expertise/value
- May be a blocker or inappropriately placed

9-Box Template



Development Guidelines

Leadership Potential ←

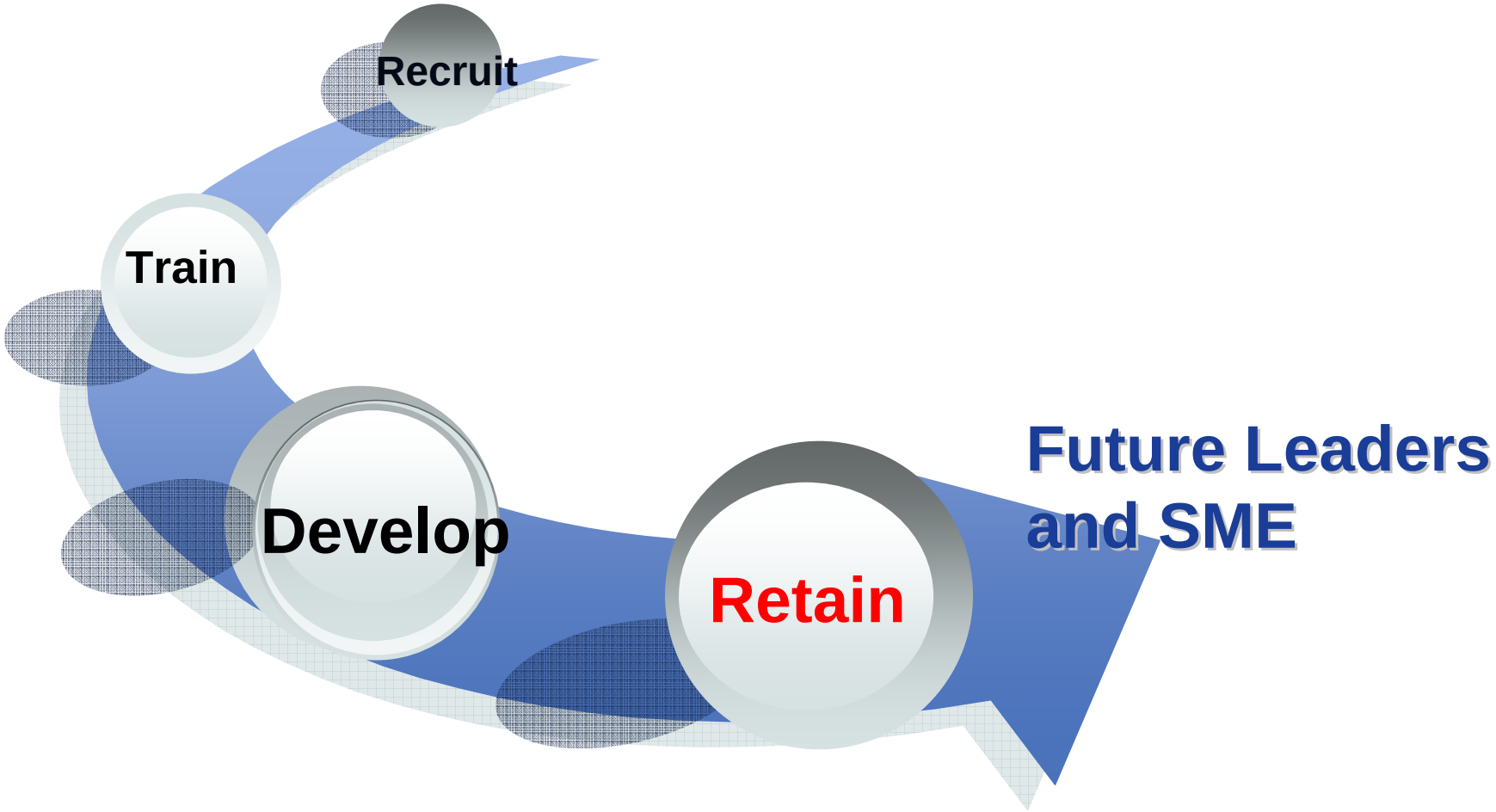
Performance ↑

1: High Performance / High Potential • Ready for promotion or significant rotational assignment. • Special assignments across organizational lines. • Provide opportunities for visibility with Sr. Leaders. • Business education (MBA, certificates, etc.) and/or assignments. • Provide mentoring and/or have employee serve as mentor. • Clarify employee career goals. • Develop replacement(s) for current position	**3: High Performance / Medium Potential** • Special assignments or projects to develop leadership skills and increase visibility. • Business education (MBA, certificates, etc.) and/or assignments. • Lateral moves or rotational assignments. • Provide mentoring. • Clarify employee career goals. • Develop replacement(s) for current position	**6: High Performance / Low Potential** • Continued development of technical expertise. • Self-directed learning (reading, on-line training, etc.) • Coach others in technical areas. Transfer critical knowledge. If in leadership role and/or is a "blocker" • Ensure expectations are clear and opportunities to show leadership exist. • Move to specialist/ technical role.
2: Medium Performance / High Potential • May be ready for promotion or significantly increased responsibilities. • Business education (MBA, certificates, etc.) and/or assignments. • Lateral moves or rotational assignments. • Provide mentoring. • Clarify employee career goals. • Develop replacement(s) for current position	**5: Medium Performance / Medium Potential** • Role-specific development (Eng. Progression Plan, Supervisor Academy, etc.). • Rotational assignments using current skill set with different issues. • Begin to focus more on business and leadership skills and less on technical skills. • Provide opportunities to work with other groups.	**8: Medium Performance / Low Potential** • Keep technical skills current • Self-directed learning (reading, on-line training, etc.) If in leadership role and/or is a "blocker" • Ensure expectations are clear and opportunities to show leadership exist. • Move to specialist/ technical role.
4: New in Position (No longer than 6 mos.) • Ensure expectations are clear and resources available. • Provide coaching and visibility. • Provide employee opportunities to perform • Reassess.	**7: Low Performance / Medium Potential** • Ensure expectations are clear, resources available, and job-specific training and coaching have been provided. • Begin Progressive Discipline process. • Prepare for move to a different role.	**9: Low Performance / Low Potential** • Ensure expectations are clear, resources available, and job-specific training and coaching have been provided.. • Begin Progressive Discipline process. • Prepare for move to a different role or to leave TVA.

Succession Planning

- Develops internal replacements for all key leadership and technical expert positions
- Values *leadership and management* capabilities as much as technical knowledge
- Actively promotes diversity, especially in leadership ranks
- Develops leaders through a variety of means (internal & external training, rotational assignments, special projects, mentoring, etc.)
- Develops managers that are effective at identifying & developing talent

Recruiting and Development Initiatives



Retaining Top Talent

- Culture and work environment (Company values…respect, integrity, accountability, teamwork, continuous improvement, honest communication, flexibility)
- Recognize and reward performance
- Motivate through challenging assignments and development opportunities (Rotational assignments, special projects, etc.)
- Fully engaged - Line of sight to company goals
- Positive Branding - Strive to be the employer of choice

Thank You!

Questions?

Work Force Planning - [Main Menu]

File Edit Insert Records Window Help Adobe PDF

Last Update from HRIS:
02/09/2007

Work Force Plan
HR Operations

- WFP and Projected Attrition/Hires
- Knowledge Retention/Attrition Survey
- Projected Hires
- Knowledge Retention Matrix
- Job Title Search
- Work Force Metrics Report

Form View

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Back Search Folders

Address \\Chapgfs1\hr_frontline

File and Folder Tasks
Other Places
Details
hr_frontline

Name	Size	Type	Date Modified
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EGPP TVA GUIDELINES		File Folder	12/18/2006 8:54 AM
Fatalities Information		File Folder	02/09/2007 10:36 AM
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52 objects

Employee Technical Training and Organizational Effectiveness - Microsoft Internet Explorer provided by TVA IE 6.0 SP2

File Edit View Favorites Tools Help

InsideNet *online resources for tva employees*

Home Contents Organizations News Employee Self Service Manager Self Service Search & Help

- Home
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- Leadership Institute
- External Training
- Knowledge Retention
- Professional Certification
- Progression Programs
- Tuition Reimbursement
- 360-Degree Feedback
- Integrated Performance Management (IPM)
- Training Schedules
- STAR 7
- OE Consulting
- Course Descriptions
- TVA Training Updates
- Trainers' Resources
- Community Programs

Training & Development

KNOWLEDGE RETENTION PLAN

Loss Assessment Monitor and Evaluate

Conduct a Knowledge Loss Risk Assessment

The process that assesses the criticality of positions and incumbents, and anticipated attrition to assist management in focusing on the most significant knowledge-retention issues.

Activity	Tools	Responsibility
Prepare management team and appropriate managers and supervisors.	Overview of the Retaining Knowledge Process	Line HR Senior Leadership Supervisors/Managers
Assess the Total Risk Factor for each position.	Knowledge Loss Risk Assessment - Guidelines for Defining and Assessing Criticality	Supervisors/Managers
Prioritize Positions	Knowledge Loss Risk Assessment Spreadsheet	Senior Leadership

Inputs:

- Workforce Plan, including attrition data
- Current and anticipated job replacements
- Employee skills and competencies
- Organization-specific critical skills inventories

Output:

- Identification of positions/incumbents to be included in the Knowledge Retention Plan

KNOWLEDGE RETENTION PLAN

Employee:	Position: Engr. Mech. General (NUC)	Position Risk Factor: Retirement Factor: 5	Total Position Factor

Summary and Situation Assessment:

The incumbent has in depth knowledge of and expertise in piping analysis with emphasis on use of software. This software is SQN and lit... duplication of knowledge exists. Though a replacement person with an engineering degree could be proficient in the use of this software in about six months, at least two years on-the-job training is needed to respond quickly to urgent questions related to piping and tuition to the T Pipe system, there must be extensive knowledge of the Class II computer system, SDP – NEDP9, and SQN LDC 13.1 and 24.2. This knowledge on with a two year degree may be knowledgeable, it is preferable to have someone with a four year degree in either Civil or Mechanical Engineering.

Currently Employee A is being cross-trained on the T Pipe system. Employee B also works with this system and has significant knowledge. Employee C and Employee D work in the Chattanooga TVAN Corporate office and also have knowledge of the system.

Because the T Pipe system is unique to SQN there is no external training on its use. However ASME does provide training on piping analysis and code requirements.

Knowledge or Skill	Criticality (1-5)	Actions *(Required of Criticality 4-5)* List steps which can and will be taken to retain this critical knowledge/skill and/or minimize the impact of its loss)	Target Date(s) for Completion	Status and Issues
Rigorous and alternate piping analysis, component qualification of code components and pipe rupture analysis skills	5	• Identify a replacement person for the critical skills • Replacement person complete ASME courses in piping analysis and code requirements • Replacement person develop a working knowledge of T-Pipe Code, ASME Code, procedures and criteria through reading and mentoring of _____ and _____.	Dec 2004 Sept 2005 Sept 2005	Employee A and Employee B are being crossed trained in T-Pipe. Will send both to ASME Course when offered by TVA Training. Both being Mentored
Development Plans	5	• Supervisor assign replacement person "trail tasks" under the direction of _____ and/or _____ • Replacement complete qualification card under mentor sponsorship • Include mentoring in _____ and ___ PR&D and developmental goals in replacement individual • Recruit/hire person to replace replacement person	March 2005 Dec 2005 Sept 2004 Oct 2005	On going replacements are
Documentation	5	Incumbent to develop a piping analysis, component qualification and pipe rupture reference library of handbooks, procedures, criteria and process in conjunction with replacement person.	Sept 2004	On going will be completed by Sept.

Knowledge Retention Plan Prepared by: OE Consultant Date: November 6, 2003
Last Update: 7/22/04; Manager