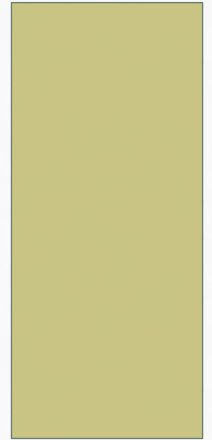# RECRUITING, SELECTING, TRAINING, AND PLACING OPERATORS

AN INTEGRATED SYSTEM

BACKGROUND

- Over the last five years, TVA has made improvements in organization, processes, equipment, and software.

- However, by the Fall of 2011, we realized that we had hit a plateau.

- We felt that additional improvements would have to come from the human component of organizational performance.

BACKGROUND

- Dr. Kaufman and his team had been working with our nuclear operators since 2004.

- His operator screening system had increased the percentage of candidates that had successfully passed the NRC exam and received their operator's license.

- My thought was to apply the same sort of discipline to hiring transmission system operators.

OLD SYSTEM

- Separate programs for recruiting, selection, training, and placement (no integration)
- Long lead times to fill vacancies
- Every department head operated independently — sometimes stealing employees from me
- Experienced candidates = high salary cost
- Training was inefficient — one trainee at a time
- No organized career planning and development process

NEW SYSTEM

- Recruit for a whole class — 4 to 6 trainees at one time.

- Entry level position — AA degree in electrical technology or equivalent experience. Some hands on experience "will be helpful."

- For selection, target people who, after training, have the potential to move into to any of the main desks and become above average performers.

BENEFITS OF NEW SYSTEM

- Having a pool of new employees reduces the lead time to fill vacancies.

- We use our training resources more efficiently.

- Salary cost is lower.

- Employee development and career planning uses diagnostic data from the hiring process.

EMPLOYEE SELECTION

THEORY

1. People are the only active parts of an organization. All the other parts — facilities, computers, transmission lines — are inert. They just sit there until a person puts them to use to create value.

2. Better people create more value.

BUSINESS CASE FOR HIRING BETTER PEOPLE

- People cost a lot: salaries, benefits, facilities, training.
- But the incremental cost is small for hiring above average employees.
- The impact from having above average employees is improved human performance for years to come.
  - Fewer failures in training
  - Quicker learning curve
  - Fewer errors in operations
  - Improved organizational performance
  - More employees with the potential to move up

SELECTION PROCESS DEVELOPMENT

- How do you create a selection process that brings in people who will become good employees and excludes people who will be come poor employees?

- Three steps
  - Define job requirements
  - Obtain valid tools to measure applicants against the job requirements
  - Make evidence-based decisions

REQUIREMENTS

- Requirements = Knowledge, skills, aptitudes, and motivation that people need to perform well.
- Common core of requirements for five major jobs
- E.g., Reading comprehension — able to read, interpret, and apply NERC standards and operating procedures.
- A few desk-specific requirements, e.g. writing ability

REQUIREMENTS

- Conceptual Ability
  - Basic skills — reading, math, abstract reasoning
  - Electrical aptitude — able to understand basic electrical concepts, schematics, flows, signals, and sequences
- Motivation
  - Commitment
  - Resilience
- Interpersonal Skills
  - Effective communication, written and oral
  - Easy to work with

SELECTION MEASUREMENTS

- Cognitive ability tests
  - Reading comprehension
  - Writing ability
  - Math
  - Electrical knowledge and aptitude
  - Abstract reasoning
- Personality test
- Vocational interest test
- Operator simulation
- Structured interview

SELECTION PLAN

| Requirements	Measurements			
	Resume	Electrical Aptitude Test	Personality Test	Interview
Conceptual Ability	X	X		
Motivation	X		X	X
Interpersonal Skills			X	X

PILOT STUDY

- Before using the measures, we evaluated them on an existing group of 27 transmission system operators.

- This allowed us to see what worked and what didn't.

- Gave us a benchmark to set cut off scores.

- Provided validity evidence for the selection process.

VALIDATION

- Validation: Evidence that shows the accuracy of the measurements used in selection.

- Compare scores from the selection process with job performance.

- For job performance, Doug and his managers rated the operators on performance and potential.

CORRELATION WITH PERFORMANCE

CUT SCORE
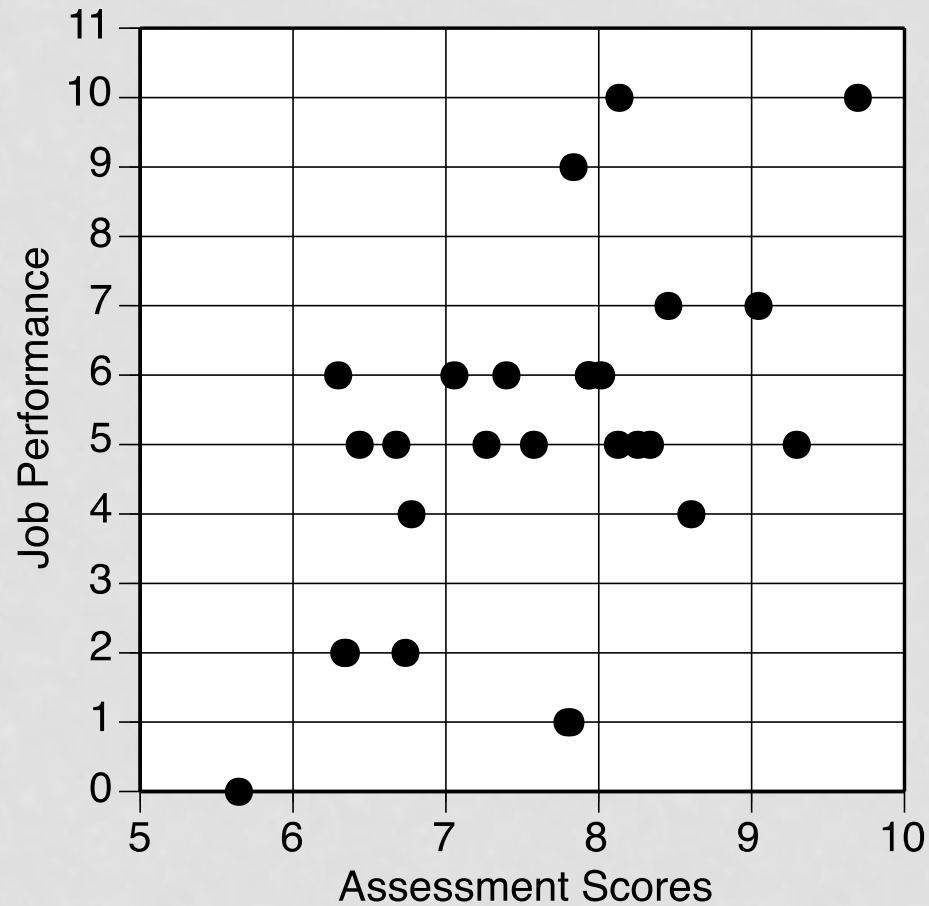
Total Assessment Score	Performance			
	Top	Middle	Bottom	Total
Score of 8 and above	5	4	1	10
Score of 7 to 7.999	5	2	2	9
Score below 7	1	2	5	8
Total	11	8	8	27

CONCLUSIONS

- Predicting human performance is not an exact science, but our accuracy was pretty good.

- Using a cut score of 7, we would have selected 91% of the candidates who were top performers (10 of 11).

- 75% of the middle performers (6 of 8).

- And we would have rejected 62.5% of the candidates who were bottom performers (5 of 8).

CONCLUSIONS

- Assuming good quality applicants, using the assessment process would
  - Increase the number of good performers
  - Reduce the number of bad performers.
- Over time, the ratio of good performers to bad performers would increase, and
- Organizational performance will improve: fewer errors, better response to emergencies, lower operating costs

THE ASSESSMENT PROCESS

Two steps

- Pre-screen. Qualified applicants take a personality test and a vocational interest test online
  - Compare profile to existing TOp's
  - Screens out people whose personality and work preferences are not a good match.

- Assessment center. Six hour assessment using all the measures: two online tests, five written test, an interview, and an operator simulation
  - Applicants evaluated in relation to pilot group
  - 1 = significantly below average, 2 = below average, 3 = above average, 4 = significantly above average.

DATA HANDLING

- Process yields 64 scores for each candidate
- Data is entered into a spreadsheet
- Raw scores are converted to standard scores
- Standard scores are combined into scores for the requirements.
- Final report

EVIDENCE BASED DECISIONS

- Candidates evaluated against all the competencies.

- Managers get a written report that ranks the candidates, highlights strengths and weaknesses, and gives recommendations for selection.

- Managers discuss the results, and, considering all the evidence, make offers to the candidates they think most likely to succeed.

HR AND EEO ISSUES

- Some HR departments don't like written tests
  - Lack of knowledge about how well tests work
  - Fear of an EEO complaint
- Facts
  - Written tests are demonstrably the best tools we have for predicting job performance.
  - Written tests are not illegal; in fact, they are easier to defend than less well developed procedures like interviews.
  - Complaints about selection processes are rare.
  - Courts give deference to employers as long as there is evidence to support the selection process.

TRAINING AND CAREER DEVELOPMENT

TRAINING

- Original idea was to train on all desks at the start, but too ambitious

- Focus now: Train system operators plus give an understanding of what the other desks do.

- Our goals
  - Develop proficient transmission system operators
  - Increase operational consistency
  - Provide a broader base of experience and appreciation for what the other desks do.
  - Create a better foundation for promotion from within
  - Create career ladders for the TOp's

RESULTS

- Trainer comment: "Really sharp group."
- The trainees passed all of their training examinations.
- The trainees all passed the NERC certification exam on the first try.
- Before, we used OJT to fill in the knowledge gaps from training.
- Now our goal is that operators know everything they are supposed to know when they leave training. OJT will be to learn to apply their classroom knowledge to operations.

JOB PLACEMENT

- Initially, our goal was to rotate trainees through each function; and, following training, place them in the job for which they were best suited.

- Now, we want to train everyone on the TOp job and then, after some experience, rotate them through the different functions as their talents and ambition permit.