



A Practical, Streamlined Approach to Testing Firefighting Skills for Promotional Exams

Edie Goldberg, Ph.D.

Sharon Rose, M.S.

CORE Corporation

IPMAAC Conference on Personnel Assessment
June 1997



Background

- 9 years of experience developing Simulations (approximately 15 unique versions)
- Over 10,000 candidates assessed using this process
- No successful challenges to the validity of this test



CORE Corporation's Average Difference Between Ethnic Group Performance on Fire Scene Simulations

<u>Test</u>	<u>Caucasian - African-American</u>	<u>Caucasian - Hispanic</u>
Test 1	.29	1.00
Test 2	.33	.46
Test 3	-.34	-.31
Test 4	.73	.63
Test 5	.78	.44
Test 6	-.15	.12
AVERAGE	.28	.39



Pulakos & Schmidt (1996) Differences Between Ethnic Group Performance in Standard Deviations

<u>Test</u>	Caucasian- African-American	Caucasian-Hispanic
Cognitive Ability	1.03	.78
Simulation	.45	.37



FIREPRO

- Customized
- Realistic
- Valid
- Reliable
- Cost effective



Testing Methods

Paper-and-Pencil Vs. Simulation





Steps for Developing a Content Valid Job Simulation

- A. Conduct a thorough job analysis.
- B. Develop a test plan that adequately covers the essential KSAs required for the job.
- C. Develop a simulation that can be standardized across many candidates, will be fair to all candidates, using an approach that will reduce adverse impact.
- D. Have Subject Matter Experts link the test to the essential job tasks.
- E. Develop a candidate preparation manual and sample videotape that will familiarize candidates with the test format.
- F. Administer tests.



FIREPRO

A promotional
examination for
firefighters

FIRE SCENE SIMULATION



Test Description

- Fire Simulation through video or photographs
- Unique Version
- FD selects specific “stimuli”
- 4-6 fire scenes
- Information about scene presented verbally (audio tape or video)
- Standardized test questions about the scene
- Candidates respond orally or in writing



Timeline

Time to Complete
(Minimum)

- Job Analysis 2 Weeks
- Test Development 2-3 Weeks
- Scoring Key Development 1 Day
- Test Implementation 1 Day
- Scoring of Tests Varies

Minimum Time: Start → End

=====

1-3 Months



FD Resources

<u>Step</u>	<u>Personnel</u>	<u>Time</u>
1. FOJAQ Review	Task Force *	2-3 hours
2. FOJAQ Administration	Sample of Incumbents	2-3 hours
3. Select Test Materials and Stimuli/Response Mode	Task Force	1-2 hours
4. Review Final Test	Task Force	1-2 hours
5. Scoring Key	Task Force	1-2 days
6. Test Administration	Testing Staff	1-2 hours plus administrative time
7. Rating of Tests	Outside FD SMEs	Estimate ½ hr. Per test

* TASK FORCE—at least 2 FD SMEs and 1 Testing Staff Member



TASK GROUP WEIGHTS

Lieutenants

Average
Relative
Importance

Firefighting Activities

Average
Relative
Time Spent

8%	#	Preparing for Tour of Duty	1%
11%	#	Alarm to Arrival	6%
12%	#	Size-Up and Incident Command	7%
12%	#	Search and Rescue	7%
8%	#	Ventilation, Salvage, & Overall	6%
====			====
51%			27%



TASK GROUP WEIGHTS

Lieutenants

Average
Relative
Importance

Other Activities

Average
Relative
Time Spent

8%	#	First Aid	10%
5%	#	Inspections	7%
3%	#	House Policy-Making	2%
6%	#	Monitoring, Evaluating, and Counseling Subordinates	7%
7%	#	Information Gathering, Report Writing And Recordkeeping	14%
7%	#	Ensuring Compliance with Departmental Policy	7%
10%	#	Training	13%
<u>4%</u>	#	Community Relations	<u>4%</u>
100%			100%



SAMPLE TASK - KSA LINKAGE

Essential Ability:

- Ability to visualize spread of fire based upon understanding of construction of building and the characteristics of its contents in order to determine approach to firefighting activity.

Linked Task Cluster: Size Up

- Involves tasks to evaluate emergency situation, to determine actions to be taken to instruct firefighters about equipment and strategy to be used, and to keep superiors informed of conditions.

Linked Task within the cluster

- Evaluates conditions of fire scene to determine type of extinguisher or extinguishing agent to use (e.g., water, carbon dioxide, dry chemical, foam, or sand).



SAMPLE TASK - KSA LINKAGE

Linked Task Cluster: Size Up

- Involves tasks to evaluate emergency situation, to determine actions to be taken to instruct firefighters about equipment and strategy to be used, and to keep superiors informed of conditions.



SAMPLE TASK - KSA LINKAGE

Linked Task within the Cluster

- Evaluates conditions of fire scene to determine type of extinguisher or extinguishing agent to use (e.g., water, carbon dioxide, dry chemical, foam, or sand).



FIRE SCENE SIMULATION

Measures:

- How well a candidate can direct a crew or company in its initial response and its response to developing situations at the scene of the fire.



Initial Customization

1. Type of fire emergency
2. The number of emergency scenes
3. Exterior and/or interior evolutions
4. Type of building:
 - A. High rise
 - B. Residential
 - C. Industrial
 - D. Commercial
 - E. Single or multiple-story apartment dwellings
 - F. Medical facilities
 - G. Schools
 - H. Entertainment spots



Example Listing of Fire Scenes From FIREPRO™ Catalog

<u>Building Type</u>	<u>Situation</u>
1. Residential Single Story	Trapped elderly person
2. Commercial Single Story	Restaurant-smoke no fire
3. Commercial/Second Level	Sparks from light fixture- Upstairs unknown
4. Multiple Story Office	No visible flame-fire reported on 8th Floor - janitor's closet
5. Entertainment/Public Assembly	Restaurant Fire
6. School	Fire in chemistry classroom
7. Church	Fire threatening valuables



FIRE SCENE SIMULATION EXAMPLE

Examples of related abilities:

- Ability to assess situation at emergency scene in order to instruct companies where to position apparatus.
- Ability to evaluate spread of fire and extent of damage on scene and decide whether to extinguish the fire or protect an exposure.



FIRE SCENE SIMULATION EXAMPLE

Examples of related task groups:

- Size-Up
- Search and Rescue
- Ventilation



FIRE SCENE SIMULATION QUESTION-ABILITY LINKAGE

Question: What additional apparatus, if any, do you request?

Examples of Linked Abilities:

- Ability to recognize the potential for the emergency to spread and the need for additional resources or assistance.
- Ability to evaluate spread of fire and extent of damage on scene and decide whether to extinguish the first or protect an exposure.



FIRE SCENE OPTIONS

- Types of buildings
- Locations of Buildings
- Contents of buildings
- Types of fires
- Weather conditions
- Time of Day
- Traffic
- Available resources
- Obstacles, special conditions



PROMOTIONAL EXAMINATION FOR FIRE OFFICERS FIRE SCENE SIMULATION

Administration

- Test instructions presented by video/audio narrator
- Response times fixed and controlled by audio or video



PROMOTIONAL EXAMINATION FOR FIRE OFFICERS FIRE SCENE SIMULATION

Video

- Individual rooms with TV and VCR
- Candidate states response into a tape recorder



PROMOTIONAL EXAMINATION FOR FIRE OFFICERS FIRE SCENE SIMULATION

Fire Photographs

- Group Administration
- Candidate listens to audiorecording of events at a fire while viewing photograph of fire scene