NFPA® 1022

Standard for Fire and Emergency Services Analyst Professional Qualifications

2025 Edition

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NFPA® 1022

Standard for

Fire and Emergency Services Analyst Professional Qualifications

2025 Edition

This edition of NFPA 1022, *Standard for Fire and Emergency Services Analyst Professional Qualifications*, was prepared by the Technical Committee on Fire Service Analysts and Informational Technical Specialists Professional Qualifications and released by the Correlating Committee on Professional Qualifications. It was issued by the Standards Council on April 22, 2024, with an effective date of May 12, 2024.

This edition of NFPA 1022 was approved as an American National Standard on May 12, 2024.

Origin and Development of NFPA 1022

In 2018, the Center for Public Safety Excellence (CPSE) and National Fire Protection Association (NFPA) co-hosted a one-day Analyst Incubator. Twenty analysts and professionals who supervise analysts from departments across North America met and created a roadmap to grow the count, role, and profile of fire and emergency service analysts. This roadmap in part became NFPA 1022, *Standard for Fire and Emergency Services Analyst Professional Qualifications*.

One of the key realizations that resulted from the Analyst Incubator was that there was no unified linear path for analysts and fire departments to follow. During the session, participants shared their diverse range of skill sets, backgrounds, and career trajectories. Participants developed an interactive subway map to illustrate the diversity in career progression, professional recognition, culture changes, and retention issues for fire and emergency service analysts. As with any subway map, there were spots where two or more lines converge, and, in this map, a data-driven paradigm shift, continuous professional development, and certifications were the converging themes.

CPSE submitted a request to NFPA to develop a fire and emergency services analyst professional qualifications standard. Given the complexity of gathering and analyzing data, and the growing sophistication of technology systems available to fire and emergency service organizations, CPSE believed a professional qualifications standard for the aforementioned analysts would be an important next step in the progression of fire and emergency service organizations. NFPA collected comments in 2019 and determined the standard was needed. CPSE Chief Executive Officer Preet Bassi was selected as the Committee Chairperson for the Technical Committee on Fire Service Analysts and Informational Technical Specialists Professional Qualifications.

The committee was assembled and met in December 2019 to form the foundation for the professional qualification standard. The committee discussed the concept of job creep in which analysts are regularly pulled into administrative and IT functions. They voted to narrow the scope to identify the minimum job performance requirements (JPRs) for personnel who use, manage, review, analyze, support, or evaluate public safety data and related technical systems. The committee also discussed if the standard would develop the standard sequential levels (i.e., Analyst 1, Analyst 2, Analyst 3). Drawing from the feedback provided during the public comment period, it became evident there was a clear distinction between the roles of these analysts. The roles were fleshed out into three clear core job functions: data analyst, geographic information system (GIS) analyst, and business analyst.

The committee worked closely with the Technical Committee on Fire Officer Professional Qualifications (the Technical Committee for NFPA 1020, *Standard for Fire Officer and Emergency Services Instructor Professional Qualifications*, which consolidated NFPA 1021, *Standard for Fire Officer Professional Qualifications*) to develop a chapter focusing on the role of a data and analytics manager. It is important to note that the stance of the Technical Committee on Fire Service Analysts and Informational Technical Specialists Professional Qualification is that this role could be filled with a civilian staff member or a uniformed fire officer.

The Technical Committee on Fire Officer Professional Qualifications plans to incorporate a number of components from Chapter 7 and other elements of NFPA 1022, *Standard for Fire and Emergency Services Analyst Professional Qualifications*, into future editions of NFPA 1020, *Standard for Fire Officer and Emergency Services Instructor Professional Qualifications*. An additional chapter, Chapter 4, Industry Specific Knowledge, was developed to outline the concept initially coined as "fire service 101." Chapter 4 outlines a baseline fire and emergency service orientation for civilian staff that might not have prior experience or exposure to the occupation.

The 2025 edition of NFPA 1022, *Standard for Fire and Emergency Services Analyst Professional Qualifications*, is dedicated to the memory of Marion Long. He passed away on March 30, 2023. The entire fire service lost a champion. Marion was a charter committee member and an active participant during the preliminary development of the standard.

After serving as the National Fire Incident Reporting System (NFIRS) State Program Manager for the Commonwealth of Virginia for many years, Marion started with the National Fire Data Center on August 30, 2009. He was the "numbers guy" and the go-to for all data at the US Fire Administration (USFA). Marion's ability to speak on complex topics in understandable ways was unmatched. He made listeners want to know more about everything. "All data will eventually show a pattern," was Marion's mantra. He helped people learn how to collect data and identify patterns. He spoke passionately about collecting everyday bits of information and turning them into something meaningful on a larger scale. Marion was a teacher, colleague, and friend. Few provided the passion and devotion to data as he did.

The committee would also like to thank Chair Preet Bassi and NFPA Staff Liaison Chelsea Rubadou for their leadership and guidance throughout the standards development process.

Correlating Committee on Professional Qualifications

Edward M. Hawthorne, *Chair*
DFW Dynamics, TX [M]
Rep. American Petroleum Institute

Brian R. Brauer, University of Illinois Fire Service Institute, IL [E]
Rep. National Board on Fire Service Professional Qualifications

Jason Dolf, Aerial Services Inc, IA [U]

Angus Maclean Duff, Consolidated Fire District 2, KS [U]

Alec Feldman, Fulcrum Consultants, Ireland [SE]
Rep. JOIFF-International Organisation for Industrial Hazard Management

Douglas P. Forsman, Fairfield Bay Fire Department, AR [L]

Richard Galtieri, Spokane Fire Department, WA [U]

Scott M. Gorgon, International Association of Fire Fighters (IAFF), DC [L]

R. Kirk Hankins, Fire Consulting & Case Review International, Inc., MO [U]
Rep. International Association of Arson Investigators, Inc.

Forest Herndon, Jr., MERE M-PACT Solutions, NJ [SE]

Bill Slosson, Washington State Patrol, WA [E]

Philip C. Stittleburg, La Farge Fire Department, WI [L]
Rep. National Volunteer Fire Council

Christopher A. Toten, US Department Of Navy, MS [E]

Charles "Randy" Watson, S-E-A, Ltd., GA [SE]

Alternates

Adam J. Goodman, S-E-A Limited, MD [SE]
(Alt. to Charles "Randy" Watson)

David W. Lewis, Odenton, MD [L]
(Alt. to Philip C. Stittleburg)

Robert W. Rand, National Board On Fire Service Prof. Qualifications, MA [E]
(Alt. to Brian R. Brauer)

Nonvoting

Stephen P. Austin, Cumberland Valley Volunteer Firemen's Association, DE [L]
Rep. TC on Traffic Control Incident Management Professional Qualifications

Preet Bassi, Center For Public Safety Excellence, VA [C]
Rep. TC on Fire Service Analysts and Informational Technical Specialist

Alan W. Conkle, Ohio Association of Emergency Vehicle Technicians (OAEVT), OH [M]
Rep. TC on Emergency Vehicle Mechanic Technicians Professional Qualifications

John S. Cunningham, Nova Scotia Firefighters School, Canada [U]
Rep. TC on Fire Fighter Professional Qualifications

Jay Dornseif, III, Priority Dispatch Corporation, SC [M]
Rep. TC on Public Safety Telecommunicator Professional Qualifications

Richard A. Dunn, SC State Firefighters' Association, SC [E]
Rep. TC on Fire Officer Professional Qualifications

Richard C. Edinger, North Myrtle Beach, SC [SE]
Rep. TC on Hazardous Materials Response Personnel

Ronald R. Farr, Plainwell Fire Department, MI [C]
Rep. TC on Electrical Inspection Practices

Dave E. Hanneman, Self Employed, ID [SE]
Rep. TC on Incident Management Professional Qualifications

Ronald L. Hopkins, TRACE Fire Protection & Safety Consultant, Ltd., KY [SE]
Rep. TC on Fire Service Instructor Professional Qualifications

Robert J. James, Ione Rose Consulting, LLC, AZ [SE]
Rep. TC on Building Fire and Life Safety Director Professional Qualifications

Randy J. Krause, Port of Seattle Fire Department, WA [E]
Rep. TC on Fire Service Occupational Safety and Health

Peter J. Mulvihill, Reno, NV [SE]
Rep. TC on Fire Inspector Professional Qualifications

Randal E. Novak, Ames, IA [SE]
Rep. TC on Accreditation & Certification Professional Qualifications

Jim Stumpf, Organizational Quality Associates, ID [SE]
Rep. TC on Wildfire Suppression Professional Qualifications

Robert D. Taylor, PRB Coal Users Group, IN [U]
Rep. TC on Industrial Fire Brigades Professional Qualifications

Nancy J. Trench, Oklahoma City, OK [M]
Rep. TC on Public Fire Educator Professional Qualifications

Paul Valentine, Zurich Insurance North America, IL [M]
Rep. TC on Fire Marshal Professional Qualifications

Robert Fash, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for the management of the NFPA Professional Qualifications Project and documents related to professional qualifications for fire service, public safety, and related personnel.

Technical Committee on Fire Service Analysts and Informational Technical Specialists Professional Qualifications

Preet Bassi, *Chair*
Center For Public Safety Excellence, VA [C]

Alexandria Baszler, Grand Rapids Fire Department, MI [U]
Adam James Blythe, North Carolina Office of the State Fire Marshal (NC OSFM), NC [E]
Thomas Breyer, International Association of Fire Fighters, DC [L]
Leonard Chan, Houston Fire Department, TX [E]
Mike Cox, ESRI, VA [M]
Jonathan Elson, Deccan International, CA [M]
Robert Farley, New Hampshire State Fire Marshal's Office, NH [E]
Wendy Korotkin, Boulder Fire Rescue, CO [U]
Robert K. McNally, Beacon GIS LLC, NC [IM]
Mike Montgomery, Michael S. Montgomery, LLC, TX [SE]
Michael O'Brian, Brighton Area Fire Authority, MI [E]
Rep. International Association of Fire Chiefs
John H. Oates, International Public Safety Data Institute (I-PSDI), CT [M]
Michael Roux, Pelham Fire Department, AL [E]
Marcus Scott, Hickory Fire Department, NC [U]
Amy Valdez, Virginia Beach Fire Department, VA [U]
Craig Weinschenk, UL's Fire Safety Research Institute, MD [RT]

Alternates

Kyle Lee Bosiljevac, Virginia Beach Fire Department, VA [U]
(Alt. to Amy Valdez)
W. Edward Buchanan, Jr., Deccan International, CA [M]
(Alt. to Jonathan Elson)
John Paul Celmer, International Association Of Fire Fighters, DC [L]
(Alt. to Thomas Breyer)
Kevin L. Haines, Frisco Fire Department, TX [C]
(Alt. to Preet Bassi)
Holli Knight, UL LLC/Fire Safety Research Institute (FSRI), MD [RT]
(Alt. to Craig Weinschenk)
Craig Rollins, Castle Rock Fire and Rescue, CO [E]
(Alt. to Michael O'Brian)

Nonvoting

Dave Millstein, US Fire Administration, MD [C]
Gregory H. Adams, US Fire Administration, MD [C]

Chelsea Rubadou, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on the professional qualifications for personnel who use, manage, review, analyze, support, or evaluate data and related technical systems in public safety agencies.

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

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Information on referenced and extracted publications can be found in Chapter 2 and Annex E.

Chapter 1 Administration

1.1 Scope. This standard identifies the minimum job performance requirements (JPRs) for personnel who use, manage, review, analyze, support, or evaluate public safety data and related technical systems.

1.2 Purpose. The purpose of this standard is to specify the minimum JPRs for serving as a fire and emergency services analyst.

1.2.1 The intent of the standard is to define levels of performance required for various roles related to data and information analysis. The authority having jurisdiction has the option to combine or group the functional areas to meet its local needs and to use them in the development of job descriptions and specifying promotional standards.

1.2.2 It is not the intent of this standard to restrict any jurisdiction from exceeding or combining these minimum requirements.

1.2.3 This standard shall cover the requirements for four functional areas: data analyst, geographic information system (GIS) analyst, business analyst, and data and analytics manager.

1.3 General.

1.3.1 All of the standards for any functional area shall be performed in accordance with recognized practices and procedures or as defined by an accepted authority.

1.3.2 It is not required for the objectives to be mastered in the order in which they appear. The local or state/provincial training program shall establish both the instructional priority and program content to prepare individuals to meet the performance objectives of this standard.

1.3.3 The fire and emergency service analyst shall remain current with the general knowledge and skills and job performance requirements addressed in the functional area qualification.

1.3.4 Prior to employment in line with the requirements of this standard, personnel shall meet the following requirements:

(1) Educational requirements established by the authority having jurisdiction (AHJ)
(2) Security clearance (if applicable) as established by the AHJ

1.3.5 Personnel hired for positions identified in this standard shall meet or be trained to meet the general knowledge requirements outlined in Chapter 4. *(See Annex C.)*

1.3.6 Wherever in this standard the terms *rules, regulations, policies, procedures, supplies, apparatus,* or *equipment* are referred to, it is implied that they are those of the AHJ.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

NFPA 1300, *Standard on Community Risk Assessment and Community Risk Reduction Plan Development,* 2020 edition.

2.3 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2020.

2.4 References for Extracts in Mandatory Sections.

NFPA 1000, *Standard for Fire Service Professional Qualifications Accreditation and Certification Systems,* 2022 edition.

NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications,* 2017 edition.

NFPA 1030, *Standard for Professional Qualifications for Fire Prevention Program Positions,* 2024 edition.

Chapter 3 Definitions

3.1 General.

3.1.1 The definitions contained in this chapter shall apply to the terms used in this standard.

3.1.2 Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used.

3.1.3 Merriam-Webster's Collegiate Dictionary, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Standard. An NFPA standard, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA manuals of style. When used in a generic sense, such as in the phrases "standards development process" or "standards development activities," the term "standards" includes all NFPA standards, including codes, standards, recommended practices, and guides.

3.3 General Definitions.

3.3.1 Address. To resolve or mitigate poor data quality in a way that lessens real or potential negative impacts to the dataset(s) or resulting analysis.

3.3.2 Artifacts. Automated behaviors, actions, or control sequences, such as database requests, calculations, grammar rules, or user-generated content.

3.3.3 Business Analyst. An individual who uses technical, administrative, and communication skills as well as organizational analytical tools to link information systems with policy, financial, and operational feedback in public safety organizations and uses analysis and assessment to evaluate processes, determine requirements, and provide data-informed recommendations and end products to executives and stakeholders.

3.3.4 Data. The lowest fractional element from which information and then knowledge can be derived; as electronically acquired, captured, stored, queried, analyzed, or transmitted; electronic or computerized in nature.

3.3.5 Data Analyst. An individual who organizes, analyzes, and presents data as an informative and reproduceable product with the purpose of providing insight for use in making strategic decisions within an organization.

3.3.6 Data and Analytics Manager. An individual who is responsible for the management and vitality of human capital, relevant processes, and analysis that support and inform the fire and emergency services organization.

3.3.7 Data Domain. A logical grouping of data, referring to interrelated data pertaining to a common purpose, object, or concept.

3.3.8 Data Reliability. The degree to which data, and the insights gleaned from it, can be trusted and used for effective decision-making.

3.3.9* Data Visualization. The graphical representation of information or data.

3.3.10 Data Warehouse. A large store of data accumulated from a wide range of sources within a department and used to guide management decisions.

3.3.11 Data Wrangling. The process of cleaning, normalizing, and transforming data into new or modified formats for the purpose of improving data quality.

3.3.12 Database Change Management (DCM). A critical part of maintaining and managing a database that involves tracking and controlling changes to the database, including both the structure of the database (such as the tables, columns, and relationships between data) and the data itself.

3.3.13 Density. A measure of quantity of data and spatial relationship based on location.

3.3.14* Dynamic Content. Content that allows users to select data elements to present findings and compare data elements against each other.

3.3.15 Ecosystem. A complex network or interconnected system.

3.3.16 Extract, Transform, Load (ETL). The process of combining data from multiple sources into a large, central repository called a "data warehouse," which is optimized for transactional and analytical processes.

3.3.17 Generally Accepted Accounting Principles (GAAP). Standards that encompass the details, complexities, and legalities of business and corporate accounting.

3.3.18 Geocode. The process of transforming a description of a location, such as a pair of coordinates, an address, or a place name, to a location on the earth's surface.

3.3.19 Geographic Information System (GIS). A system that enables the creation, management, analysis, and mapping of various types of data by an analyst.

3.3.20 Geographic Information System (GIS) Analyst. An individual who designs, develops, and implements spatial databases and analyzes spatial and related nonspatial data.

3.3.21 Job Performance Requirement (JPR). A written statement that describes a specific job task, lists the items necessary to complete the task, and defines measurable or observable outcomes and evaluation areas for the specific task. [**1000**, 2022]

3.3.22 Key Performance Indicator (KPI). A set of quantifiable measurements used to gauge a department's overall long-term performance.

3.3.23* Metadata. Information associated with data that provides contextual details.

3.3.24 Models. A set of rules and procedures for representing a phenomenon or predicting an outcome.

3.3.25 Open File Format. A published specification for storing digital data, usually maintained by a standards organization.

3.3.26* Outlier. An observation that lies an abnormal distance from other values in a random sample from a population.

3.3.27 Policy. A course or principle of action adopted or proposed by a government, party, business, or individual.

3.3.28 Procedure. A series of actions conducted in a certain order or manner.

3.3.29 Process. In geoprocessing, a tool and its parameter values.

3.3.30* Process Map. A planning and management tool that visually describes the flow of work.

3.3.31* Program. A set of related measures or activities with a particular long-term aim.

3.3.32* Project. A series of tasks that need to be completed to reach specific objectives.

3.3.33 Project Plan. A series of formal documents that define the execution and control stages of a project.

3.3.34 Projection. Converting the coordinate system of a curved surface to a flat surface using mathematical calculations.

3.3.35 Public. Of, relating to, or affecting a population or a community as a whole

3.3.36 Quality Assurance (QA). A process by which all the planned and systematic activities implemented can be demonstrated to provide confidence that an activity will fulfill requirements for quality.

3.3.37 Query. A request to select features or records from a database that is often written as a statement or logical expression.

3.3.38 Requisite Knowledge. Fundamental knowledge one must have in order to perform a specific task. [**1030**, 2024]

3.3.39 Requisite Skills. The essential skills one must have in order to perform a specific task. [**1030**, 2024]

3.3.40 Root Cause Analysis (RCA). The process of discovering the root causes of problems in order to identify appropriate solutions.

3.3.41* Schema. The structure or design of a database or database object, such as a table, view, index, stored procedure, or trigger.

3.3.42 Spatial Data. Data that references a geographical location.

3.3.43 Stakeholder. One who is involved in or affected by a course of action.

3.3.44 Standard Operating Guideline (SOG). See 3.3.45, Standard Operating Procedure (SOP).

3.3.45 Standard Operating Procedure (SOP). Established or prescribed methods to be followed routinely for the performance of designated operations or in designated situations.

3.3.46* Static Content. Content that displays data that typically focuses on only a single relationship.

3.3.47 Statistical Analysis. The process of collecting and analyzing large volumes of data to identify trends and develop valuable insights.

3.3.48* Tabular Data. Descriptive information, usually alphanumeric, that is stored in rows and columns in a database and can be linked to spatial data.

3.3.49 Task. A specific job behavior or activity. [**1002**, 2017]

Chapter 4 Industry Specific Knowledge

4.1* General. For qualification at any of the applicable fire and emergency service analyst positions defined in Chapters 5 through 8, the candidate shall meet the requirements in Sections 4.2 through 4.9 following the point of hire.

4.2 Fire and Emergency Services Administration.

4.2.1 The member shall be able to explain the history of the fire and emergency service organization and the fire service and emergency medical service (EMS) industry in general.

4.2.2 The member shall be able to explain the fire and emergency service organization's organizational chart and the role and responsibilities of different ranks and job classifications.

4.2.3 The member shall be able to explain the department's incident command system (ICS) from a single unit to a multijurisdictional response.

4.2.4 The member shall be able to explain the shift schedule used by the fire and emergency service organization.

4.2.5 The member shall be able to explain the role of the AHJ in the fire and emergency service organization's administration and operations.

4.2.6 Where applicable, the member shall be able to explain the role of the labor union(s) that represents the fire and emergency service organization's members with respect to negotiating for wages, benefits, health and safety, staffing, and other subjects of bargaining as dictated by federal, tribal, territorial, state, provincial, or local laws.

4.2.7 Where applicable, the member shall be able to explain the role of any member associations, which might be distinct from any labor unions, that the fire and emergency service organization members might join that provide support, education, mentorship, networking opportunities, and cultural awareness for specific populations.

4.2.8 The member shall be familiar with the department's standard operating procedures/standard operating guidelines (SOPs/SOGs) and federal, tribal, territorial, state, provincial, and local laws.

4.2.9 The member shall be able to explain the difference between a jurisdictional boundary and an operational boundary.

4.3 Apparatus, Ambulance, Specialty Vehicles, and Command Units.

4.3.1 The member shall be able to identify and discuss the staffing, purpose, and tactical uses of the various apparatus, ambulances, and vehicles supported by the department.

4.3.2 The member shall be able to discuss the staffing, purpose, and tactical uses of the engine company.

4.3.3* The member shall be familiar with the equipment on the engine company.

4.3.4 The member shall be able to discuss the staffing, purpose, and tactical uses of the ladder company.

4.3.5* The member shall be familiar with the equipment on the ladder company.

4.3.6 The member shall be able to discuss the staffing, purpose, and tactical uses of the ambulances.

4.3.7* The member shall be familiar with the equipment on the ambulance(s).

4.3.8 The member shall be able to discuss the staffing, purpose, and tactical uses of the command units.

4.3.9 The member shall be familiar with the equipment on the command unit(s).

4.3.10* The member shall be able to discuss the staffing, purpose, and tactical uses of the fire and emergency service organization's specialty apparatus and vehicles.

4.3.11 The member shall be familiar with the equipment carried by these units.

4.4* Firefighter Safety and Health.

4.4.1 The member shall be able to explain the tactical priorities of life safety of community members and firefighters, incident stabilization, and property conservation.

4.4.2 The member shall be able to explain the conditions under which firefighter injuries and fatalities commonly occur.

4.4.3* The member shall be able to explain aspects and limitations of firefighter personal protective equipment (PPE).

4.4.4 The member shall be able to explain how to access member assistance and wellness programs.

4.4.5 The member shall be familiar with pertinent health and safety regulations as mandated by federal, tribal, territorial, state, provincial, and local AHJs.

4.4.6 The member shall be able to explain incident control zones.

4.4.7 The member shall be able to explain the personnel accountability system used by the department.

4.4.8 The member shall be able to explain the benefits of being physically and medically capable of performing assigned duties during emergency and nonemergency operations and effectively functioning during peak physical demand activities, given current fire service trends and organizational policies.

4.4.9 The member shall be able to explain the negative consequences of exposure to dangerous, toxic, hazardous, and/or biohazardous materials during emergency and nonemergency operations that are produced as a product of combustion, the routes of exposure and absorption, and the potential long-term effects of exposure.

4.4.10 The member shall be able to explain the negative consequences of repetitive motion injuries and the potential long-term effects of such injuries, both on and off station and during emergency and nonemergency operations.

4.4.11 The member shall be able to explain the modes of disease transmission and the potential diseases that responders could be exposed to during patient care and management, both on and off station and during emergency and nonemergency operations.

4.4.12 The member shall be able to explain the common behavioral health problems in the fire service and the consequences of exposure to potentially traumatic events.

4.5 Fire Growth and Development.

4.5.1* The member shall be able to explain the dynamics of fire growth and development.

4.5.2 The member shall be able to explain the classification of fires.

4.5.3* The member shall be able to explain the development of fire in a compartment.

4.5.4* The member shall be able to explain fire control.

4.5.5 The member shall be able to explain and discuss the timeline of fire development.

4.6 Building Construction.

4.6.1* The member shall be familiar with building construction.

4.6.2 The member shall be able to explain the hazards firefighters might face in relation to building construction.

4.7 Fire Control and Suppression.

4.7.1 The member shall be able to explain the various types of fire extinguishers used by the department and the appropriate fires for which they should be used.

4.7.2 The member shall be able to explain the purpose and function of sprinkler systems.

4.7.3 The member shall be able to explain the different types of hose used by the fire and emergency services organization and the criteria for selected hose for fireground task completion.

4.7.4 The member shall be able to explain the different fire streams that could be used during suppression.

4.7.4.1 The member shall be able to explain how to use fire streams for gas cooling.

4.7.4.2 The member shall be able to explain how to conduct a direct attack.

4.7.4.3 The member shall be able to explain how to conduct an indirect attack.

4.7.4.4 The member shall be able to explain how to conduct a combination attack.

4.7.5 The member shall be able to discuss the use of master streams and elevated master streams.

4.7.6 The member shall be able to discuss controlling and suppressing Class A, B, C, and D fires.

4.7.7 The member shall be able to discuss the importance of controlling utilities on the fireground.

4.7.8* The member shall be able to discuss the tactics of suppressing structure fires in low-, medium-, and high-hazard occupancies.

4.7.9 The member shall be able to discuss the tactics of suppressing vehicle fires.

4.7.10 The member shall be able to discuss the hazards and tactics of suppressing fire in the wildland urban interface.

4.7.11 The member shall be able to explain the need, process, and tactical considerations of ventilation.

4.7.12 The member shall be able to explain the need, process, and tactical considerations of forcible entry.

4.7.13 The member shall be able to explain the need, process, and tactical considerations of overhaul and salvage.

4.7.14 The member shall be able to explain the need and tactical considerations of having a dedicated water supply.

4.7.14.1 The member shall be able to explain the various ways water can be delivered in the department's jurisdiction.

4.7.14.2 The member shall be familiar with the department jurisdiction's water main network.

4.7.15 The member shall be able to explain the need for evaluating the response time continuum to evaluate baseline time data and establishing performance benchmarks to improve operations and enhance safety.

4.8 Emergency Medical Services.

4.8.1 The member shall be able to explain the function and capability of the various levels of EMS care provided by the fire and emergency services organization.

4.8.2 The member shall be able to explain the position of the physician medical director and their role in the department's provision of EMS care.

4.8.3 The member shall be able to identify and explain the EMS equipment carried on apparatus, ambulances, and other vehicles.

4.8.4 The member shall be able to identify and explain service delays that reduce unit availability.

4.8.5 The member shall be able to explain the prohibitions and allowances of medical privacy regulations and how they apply to the individual and the fire and emergency services organization.

4.8.6 The member shall be able to explain the continuous quality improvement process of EMS incidents.

4.8.7 The member shall be able to identify and explain the required data collection points of an EMS incident report.

4.8.8 The member shall be able to explain the need for evaluating the response time continuum to evaluate baseline time data and establishing performance benchmarks to improve operations and patient outcomes.

4.9 Rescue and Extrication.

4.9.1* The member shall be able to identify and explain the various rescue equipment used by the fire and emergency services organization.

4.9.2 The member shall be able to identify and explain safety considerations for rescue and extrication operations.

4.9.3 The member shall be able to discuss the different types of building collapse.

4.9.3.1 The member shall be able to discuss the hazards and needs of responding to a structural collapse.

4.10 Hazardous Materials Response.

4.10.1 The member shall be able to discuss and explain the problem-solving stages of a hazmat incident.

4.10.2 The member shall be able to discuss the general considerations for decontamination.

4.10.2.1 The member shall be able to discuss the different types of decontamination.

4.10.3 The member shall be able to discuss the establishment of an isolation perimeter and hazard control zones.

4.10.4 The member shall be able to discuss the considerations related to protecting the public from a toxic release, including but not limited to evacuation, community alerting, sheltering, transportation and relocation.

4.11 Fire Detection, Alarms, and Telecommunications.

4.11.1 The member shall be able to explain the various smoke, heat, and flame detectors and how they function.

4.11.2 The member shall be able to explain an automatic alarm system and how it functions.

4.11.3 The member shall be able to describe the communication responsibility of a firefighter.

4.11.4 The member shall be able to describe the role and responsibilities of the telecommunicator.

4.11.5 The member shall be able to explain the process for call taking and dispatching.

4.12* Community Risk Reduction and Public Education.

4.12.1 The member shall be able to explain and discuss the need for, and the components of, a routine community risk assessment.

4.12.2 The member shall be able to explain and discuss the need for a comprehensive community risk reduction plan and program, given the information provided by the fire and emergency services organization.

4.12.3 The member shall be able to explain the process of conducting a community risk assessment.

4.12.3.1 The member shall be familiar with and able to explain the local organizations that can assist with the fire and emergency services organization's community risk reduction plan.

4.12.3.2* The member shall be able to discuss the components and principles of community risk reduction.

4.12.3.3 The member shall be familiar with applicable fire prevention and building safety codes, and ordinances applicable to the jurisdiction.

4.12.4 The member shall be able to discuss and explain the need for fire inspections, pre-incident planning, and fire and injury prevention programs.

4.12.4.1 The member shall be able to explain the need for public education.

4.13 Reporting.

4.13.1 The member shall be able to assess a basic incident report for emergency services, whether it be fire, EMS, or another emergency, and identify whether pertinent information is recorded, the information is accurate, and the report is complete.

4.13.2 The member shall explain the importance of, and associated process related to, the continuous quality improvement/quality assurance (CQI/QA) program for dispatch, EMS, and postincident review.

4.13.3 The member shall be able to assess a fire inspection report and identify whether pertinent information is recorded, the information is accurate, and the report is complete.

4.13.4 The member shall be able to assess a fire and explosion investigation report and identify whether pertinent information is recorded, the information is accurate, and the report is complete.

4.13.5 The member shall be able to discuss the response time continuum for incidents as it pertains to mitigation, outcomes, personnel, and community member safety, and measuring performance.

4.13.6 The member shall be able to discuss the fire and emergency service organization's reporting requirements, privacy concerns, and data retention policies as well as pertinent laws.

Chapter 5 Data Analyst

5.1 General. The fire and emergency services analyst shall be proficient in the use of information systems and data analysis methods and techniques to query, analyze, and present data to assist the fire and emergency services organization in reporting and developing periodic reports, strategic plans, and standards of cover documents.

5.1.1 For qualification as a data analyst, the candidate shall meet the job performance requirements (JPRs) defined in Sections 5.2 through 5.8.

5.1.2 General Prerequisite Knowledge. Familiarity with analyzing information; specifically identifying, processing, querying, and visualizing data to assist the fire and emergency services organization in providing information required by external and internal agencies and for analytical and decision-making purposes; a pursuit of data integrity and sustainable data management for reliable, efficient, and long-term use.

5.1.3 General Prerequisite Skills. The ability to demonstrate formal training or workplace experience using datasets and data sources, as well as understanding their respective properties; investigate, organize, and present data as a comprehensible analysis; and produce documentation regarding data considerations and analytical processes.

5.2 Identify, Access, and Extract Data. This duty involves verifying data needs, parameters, and analytical limitations while establishing connections to one or more data sources and extracting the dataset.

5.2.1 Verify data needs, parameters, and analytical limitations, given a request for information, so that the scope, data requirements, and estimated level of effort required to perform the analysis are defined.

(A) Requisite Knowledge. Current data resources, the organization's data sharing policies, and analytical processes.

(B) Requisite Skills. The ability to communicate clarifying questions.

5.2.2 Access one or more data sources, given a set of data parameters and appropriate access to data, so that the information is able to be assessed.

(A)* Requisite Knowledge. Content of data sources, who to ask for any additional data source access, records management systems (RMS) and computer-aided dispatch systems (CAD) software, and internal and external data sources.

(B)* Requisite Skills. The ability to request data from restricted data sources and review data from one or more sources using the data management software.

5.2.3 Extract data, given an established connection to data sources, so that a dataset is available for use independent of the system of origin.

(A)* Requisite Knowledge. Database structure/schema, data relationship structures and types, conversion options, and RMS and CAD software.

(B) Requisite Skills. The ability to generate formatted data in a readable, accessible format and prepare data for validation.

5.3 Validate Data Extraction Process and Output. This duty involves inspecting and evaluating datasets to ensure any issues that might affect the validity of the analysis are identified and documented.

5.3.1* Inspect the output dataset, given a dataset and data systems, so that potential issues are identified and documented.

(A) Requisite Knowledge. Common data output issues.

(B) Requisite Skills. The ability to identify errors in data and issues in formatting.

5.3.2 Evaluate data quality issues, given appropriate data review tools and a dataset with known issues, so that scope of

the issues is determined and corrective actions are documented.

(A)* Requisite Knowledge. Organizational standards and typical data results.

(B) Requisite Skills. The ability to locate data quality issues in a dataset.

5.4 Resolve/Repair. This duty involves addressing data quality errors by transforming data, communicating data limitations and potential solutions, and verifying repairs.

5.4.1 Perform data wrangling, given a need to resolve anomalous and erroneous data, so that data analysis is valid and reliable.

(A)* Requisite Knowledge. The organization's guidelines, policies, or procedures for modifying data; dataset requirements and impact upon modification; and data wrangling techniques.

(B)* Requisite Skills. The ability to access and operate data platforms and applications and transform data.

5.4.2 Communicate any limitations in the dataset, given anomalous and erroneous data, so that the causes and remedies are annotated and can be addressed by the owners of the data.

(A) Requisite Knowledge. Business, procedural, or operational processes that impact data quality; and understanding successful mitigation strategies.

(B) Requisite Skills. The ability to access and operate data platforms and applications, and to communicate the pertinent attributes of the dataset that impact the accuracy of the final analysis.

5.4.3 Verify repairs to a dataset were successful, given a repaired database, so that inconsistencies in the data are addressed.

(A) Requisite Knowledge. Dataset's impact upon modification, and common dataset anomalies and errors.

(B) Requisite Skills. The ability to search for data in the database and transform data.

5.5 Organize the Data. This duty involves standardizing the data type and format and structuring the data for analysis.

5.5.1* Standardize data type and format, given a dataset and agency data conventions, so that data are put into a compliant type and format per agency requirements.

(A) Requisite Knowledge. Data typing and formatting, methods of storing data, and data elements.

(B) Requisite Skills. The ability to format and type data in platforms and applications used by the organization.

5.5.2* Structure data for analysis, given data from one or more sources, so that data from multiple sources can be used within the available analysis program.

(A) Requisite Knowledge. Database design and management, and relating information across different database objects and datasets.

(B) Requisite Skills. The ability to compile a dataset into a usable format for analysis.

5.6 Analyze Data. This duty involves analyzing nonspatial data through the determination of data analysis methods and techniques, performing the data analysis, and ensuring the analysis meets the requirements of the documented request according to the following JPRs.

5.6.1 Determine the analysis methods and techniques, given the available data and type of request, so that a systematic and objective approach is used and supports the project goals.

(A) Requisite Knowledge. Data analysis concepts and standards, and an understanding of commercially available or agency specific data analysis platforms/tools.

(B) Requisite Skills. The ability to apply appropriate analytical techniques or methods, select the most efficient analytical tool, and identify any additional resources to meet the project objectives.

5.6.2* Perform data analysis, given a request, access to applicable datasets, and analysis tools, so that the result(s) and process(es) satisfy the request.

(A) Requisite Knowledge. General statistical analysis methods.

(B) Requisite Skills. The ability to use an analytical tool and apply analytical techniques.

5.6.3* Perform quality assurance (QA), given data analysis results, so that the results meet the objectives of the original request.

(A) Requisite Knowledge. Relevant data elements, data domain application, and AHJ QA procedures.

(B) Requisite Skills. The ability to use QA techniques to identify areas of quality concern and recommend a course of corrective action.

5.7 Present Analysis. This duty involves developing the best method(s) to share an analysis and considering who will be consuming the information, in what environment, and through what type(s) of available media.

5.7.1 Design a method to communicate information, given presentation requirements and data artifacts from an analysis, so that the information is accessible and specific to the targeted audience.

(A)* Requisite Knowledge. Characteristics of the audience, presentation opportunities and limitations, and presentation design and methodology.

(B) Requisite Skills. The ability to conduct research and apply data visualization techniques for different print and electronic media.

5.7.2 Communicate the results, given the results of an analysis, presentation tools, and an audience, so that the original request is addressed, any additional relevant information is outlined, and questions are addressed.

(A) Requisite Knowledge. Presentation and visualization tools.

(B) Requisite Skills. The ability to communicate orally, visually, and in writing the results of an analysis and related questions.

5.8 Documentation. This duty involves providing technical notes and process steps taken during the entire data staging

and analysis process and creating a document that allows for reproduction and transparency of the results.

5.8.1 Produce technical notes, given details about data access, repairs, and data reliability, so that data considerations are documented for future reference, repeatability, and continued analysis.

(A) Requisite Knowledge. The organization's documentation guidelines; the data access, extraction, and validation process; and the original scope and purpose of the data request.

(B) Requisite Skills. The ability to communicate technical notes in writing.

5.8.2 Compile analysis instructions, given the original request and technical notes, so that the organization has access to a transparent and reproducible record of the entire analysis process.

(A) Requisite Knowledge. The organization's documentation guidelines and the data analysis process for the current project.

(B) Requisite Skills. The ability to communicate analysis instructions in writing, including organizing information chronologically.

Chapter 6 GIS Analyst

6.1* General. The fire and emergency services analyst shall be proficient in the use of geographic information systems (GIS) to analyze, query, visualize, and conduct geoprocessing of spatial data and related nonspatial data to assist the fire and emergency services department in reporting and developing periodic reports, strategic plans, and standards of cover documents.

6.1.1 For qualification at GIS analyst, the candidate shall meet the JPRs defined in Sections 6.2 through 6.10.

6.1.2 General Knowledge Requirements. Spatial concepts and basic cartographic knowledge, spatial and nonspatial data types and sources for use in GIS analysis, data quality assurance methods and techniques, and methods to manipulate and transform GIS data for geoprocessing and other spatial analysis procedures.

6.1.3 General Skill Requirements. The ability to demonstrate formal training or workplace experience in the use of GIS, use data source properties and metadata, query data for use in spatial analysis and statistical functions,and create visualizations that present the analysis that was conducted.

6.2 Assemble GIS Data. This duty involves determining spatial data and other relevant data to be sourced and collected for preparation of GIS analysis.

6.2.1* Gather data, given various sources, so that it is accessible for analysis.

(A) Requisite Knowledge. Spatial and tabular data sources relevant to the analysis to be conducted.

(B) Requisite Skills. The ability to determine relevant data for analysis.

6.2.2* Extract data, given various sources, so that data can be used in the analysis.

(A) Requisite Knowledge. Data extraction.

(B) Requisite Skills. The ability to extract data from various data types.

6.3 Ensure Data Integrity and Suitability. This duty involves ensuring the spatial data of interest is valid, complete, and appropriate for the intended use-case.

6.3.1* Validate data formatting, given a dataset, so that the data are correct for the GIS being used.

(A) Requisite Knowledge. Correct procedures necessary to validate spatial database schema or a feature collection.

(B) Requisite Skills. The ability to use GIS to validate appropriate data for a given workflow or use-case.

6.3.2 Determine reliability of a dataset, given spatial data, so that sources of imprecision and error are identified and quantified.

(A) Requisite Knowledge. Evaluation of a dataset's reliability, and workflows to correct issues.

(B) Requisite Skills. The ability to use GIS to determine the reliability of data for a given workflow or use-case.

6.3.3* Determine credibility of a dataset, given spatial data from outside sources, so that the spatial data can be relied on to ensure that the data are useful for the analysis.

(A) Requisite Knowledge. Functions of GIS software to verify that the data does not conflict with specified acceptance criteria, and use of metadata to evaluate source.

(B) Requisite Skills. The ability to evaluate a dataset's attributes and metadata.

6.4 Manage Data. This duty involves mastering the different types of spatial data formats, and importing, cleaning, and storing the data.

6.4.1* Determine spatial data formats, given access to various data types, so that different spatial data can be organized and used according to the data type.

(A) Requisite Knowledge. Spatial data formats available for use in a GIS.

(B) Requisite Skills. The ability to interpret spatial data and information for the purpose of analyzing, querying, editing, and visualizing a spatial project.

6.4.2 Add data into a GIS, given various spatial data types, images, or global positioning systems (GPS), so that the data can be stored and arranged for analysis.

(A) Requisite Knowledge. The functions and input mechanisms of the GIS software used to add the spatial data, data types, and capabilities and limitations of GIS software.

(B) Requisite Skills. The ability to navigate and manipulate the software platform.

6.4.3* Use data properties, given a spatial dataset with desired analysis outcome, so that individual data layers can be displayed and examined.

(A) Requisite Knowledge. Symbol properties and classes, coordinate system knowledge, tabular structure, scale references, and display properties.

(B) Requisite Skills. The ability to interpret symbology as it relates to the data visualization, tabular schema, coordinate systems, and labeling properties.

6.4.4 Examine metadata, given the various spatial data types, so that details and descriptions for use, restriction, credit attribution, spatial extent, geographic and tabular properties, and attribute descriptions can be determined.

(A) Requisite Knowledge. Spatial extent of a dataset, the data's legal implications of use, the attribute's structure, and types of data and metadata.

(B) Requisite Skills. The ability to examine spatial metadata for attribute properties, spatial implications within the project, and legal ability for use.

6.4.5 Distinguish between coordinate systems and projections, given spatial data, so that geoprocessing analysis can be conducted using the correct geographic reference.

(A) Requisite Knowledge. Geographic and projected coordinate types and datums to use for the geographic locale applied, and coordinate systems and projections.

(B) Requisite Skills. The ability to interpret coordinate system data, and to convert one coordinate system to another.

6.4.6 Organize spatial data folders into a database, given various data formats, so that the data can be synthesized for spatial analysis.

(A) Requisite Knowledge. Spatial databases, relational spatial data construction and storage, data formats, and folder structures.

(B) Requisite Skills. The ability to develop topology and relational databases for the construction of a spatial database.

6.5 Transform Data. This duty involves modifying and transforming data to be used in GIS.

6.5.1 Convert between coordinate systems, given data containing a spatial reference, so that the data are transferred from the initial system to the new system without errors.

(A) Requisite Knowledge. Types of coordinate systems, effect on spatial representations, and common conversion and troubleshooting conversion errors.

(B) Requisite Skills. The ability to convert and transform coordinate systems using tools in a GIS, and check for conversion errors.

6.5.2 Convert data, given a tabular dataset with spatial referenced attributes, so that data are in geographic representation.

(A) Requisite Knowledge. Spatial references and how to transform them into spatial datasets.

(B) Requisite Skills. The ability to perform geocoding tasks using the spatial software platform provided.

6.5.3* Modify data attributes and symbology, given spatial data, so that the data can be represented and analyzed in a GIS.

(A) Requisite Knowledge. Cartographic principles; and labels, symbology, and data classification methods.

(B) Requisite Skills. The ability to change scale, apply symbology changes according to cartographic principles, and manipulate map labels.

6.5.4* Convert data to a format required by the stakeholder, given a spatial dataset that requires change, so that the spatial data can be consumed by the stakeholder.

(A) Requisite Knowledge. Spatial data formats, and methods of converting one data format to another for the intended use.

(B) Requisite Skills. The ability to convert spatial data to other formats within the GIS software being used.

6.5.5 Re-establish spatial data source, given spatial data that is disconnected from its original source location, so that the data can be used in the GIS.

(A) Requisite Knowledge. Relationship between content spatial data and the file path to its referenced source.

(B) Requisite Skills. The ability to reconnect or replicate the spatial data source using the tools within the GIS software.

6.5.6 Apply queries, given a spatial dataset, so that only the required subset of data will be visible.

(A) Requisite Knowledge. Dataset attributes, and structured query language to select or filter data.

(B) Requisite Skills. The ability to use the various tools and methods to filter and select data within the GIS software.

6.6 Geoprocessing. This duty involves managing data in preparation for geographic referencing using GIS software tools for visualization of the spatial attribute information.

6.6.1 Perform data management, given spatial and nonspatial data, so that a dataset can be modified to meet job-specific objectives.

(A) Requisite Knowledge. Geoprocessing functions, GIS software tools, and spatial and nonspatial data types.

(B) Requisite Skills. The ability to use geoprocessing tools to appropriately convert, modify, join, and update a dataset.

6.6.2* Geocode data, given spatial or nonspatial data with location information, so that the data can be geographically represented in a GIS.

(A) Requisite Knowledge. Geocoding concepts and GIS software tools.

(B) Requisite Skills. The ability to load the data source into an application that will use reference data to assign each unique feature its own coordinates of location.

6.6.3* Create tools and models, given job-specific objectives, so that tasks and duties can be automated.

(A) Requisite Knowledge. Programing language(s) and GIS software tools.

(B) Requisite Skills. The ability to develop tools and models to use when analyzing data and when automating tasks and duties.

6.7 Analysis. This duty involves using spatial and statistical GIS software tools to analyze data.

6.7.1* Geographically evaluate response objectives, given data, so that response objectives identified by industry standards or the AHJ can be calculated.

(A) Requisite Knowledge. Spatial analysis, transportation network, and GIS software tools.

(B) Requisite Skills. The ability to use tools available in GIS software that evaluate response data.

6.7.2* Determine locations for resources, given parameters established by the AHJ, so that resource locations can be evaluated.

(A) Requisite Knowledge. Location attributes, map features, and GIS software tools.

(B) Requisite Skills. The ability to execute an allocation model using locations and parameters identified by the AHJ to determine the location to position resources.

6.7.3* Assess community risk, given data outlined in 5.3.2 of NFPA 1300, so that risk in a jurisdiction can be evaluated based on criteria outlined by the AHJ.

(A) Requisite Knowledge. Statistical methods, data extraction, and GIS software tools.

(B) Requisite Skills. The ability to use statistical processes to identify correlations/relationships between community factors and historical call volume.

6.7.4* Perform statistical analysis, given spatial data, so that spatial distribution, patterns, and relationships with the data can be identified.

(A) Requisite Knowledge. Statistical models and GIS software tools.

(B) Requisite Skills. The ability to use GIS statistical tools to incorporate geographic data directly into the statistical models to identify spatial distributions, patterns, and relationships.

6.7.5 Calculate density of data, given spatial data, so that areas of interest can be identified.

(A) Requisite Knowledge. Spatial analysis, density models, and GIS software tools.

(B) Requisite Skills. The ability to use density models to produce an output that will identify the density of the data.

6.7.6 Perform spatial analysis, given spatial data, so that spatially based questions can be answered.

(A) Requisite Knowledge. Spatial analysis and GIS software tools.

(B) Requisite Skills. The ability to use GIS applications to examine spatial data.

6.7.7 Conduct temporal analysis, given spatial data with time information, so that patterns and trends can be investigated.

(A) Requisite Knowledge. Temporal analysis and GIS software tools.

(B) Requisite Skills. The ability to calculate and analyze patterns and trends over time.

6.8 Visualization. This duty involves using knowledge of map and coordinate projections along with geospatial software tools to enrich spatial data required for analysis.

6.8.1 Organize data, given spatial data, so that results can be viewed as a singular map or series of maps in a map book.

(A) Requisite Knowledge. Map projection definitions and types, coordinate system definitions, ratio of a distance on a map to the corresponding distance on the ground, output file types, and GIS software tools.

(B) Requisite Skills. The ability to turn spatial data into operational map-based output.

6.8.2 Transform map projections, given spatial data, so that data can be shared across platforms with different map projections.

(A) Requisite Knowledge. Map projection definitions and types, coordinate system definitions, and GIS software tools.

(B) Requisite Skills. The ability to use GIS software tools to identify and manipulate map projections to create appropriate output.

6.8.3 Create static content, given spatial data, so that results can be shared as print and digital media.

(A) Requisite Knowledge. Static output types and GIS software tools that facilitate static outputs.

(B) Requisite Skills. The ability to create output in static formats and frame contextual information within output.

6.8.4 Create dynamic content, given spatial data, so that results can be shared in interactive digital formats.

(A) Requisite Knowledge. Dynamic output types and GIS software tools that facilitate output for digital platforms.

(B) Requisite Skills. The ability to create output in dynamic formats and frame contextual information within output.

6.8.5* Integrate uncertainty, given spatial data with statistical information, so that variations in data can be presented.

(A) Requisite Knowledge. Statistical methods and GIS software tools.

(B) Requisite Skills. The ability to interpret statistical conclusions and integrate them into the output product.

6.9 Sharing. This duty involves using spatial file formats, version control systems, and industry standards for distributing spatial data analysis outputs.

6.9.1 Export data to open-file formats, given spatial data, so that the output of the project is easily shared with and consumed by stakeholders.

(A) Requisite Knowledge. Spatial output formats available for digital and print consumption.

(B) Requisite Skills. The ability to generate an output to be displayed on platforms without the need for specialized support software.

6.9.2* Produce an annotated output, given spatial data, so that relevant development information is included within the file's metadata.

(A) Requisite Knowledge. Tools used to create the file, data source, and data usage rights.

(B) Requisite Skills. The ability to modify metadata of desired output type.

6.9.3 Maintain a version history of data, given a spatial data management system, so that modifications to the data can be tracked.

(A) Requisite Knowledge. Version control practices and systems for different file types.

(B) Requisite Skills. The ability to use software packages and tools.

6.9.4 Maintain open records of data sources, given spatial data, so that the data is publicly accessible.

(A) Requisite Knowledge. Industry standards for storing, versioning, sharing data, and tracking where/how data was created.

(B) Requisite Skills. The ability to work with data while preserving the integrity of the source data, provide opportunity for others to obtain data, and validate the history and origin of the information.

6.10 Documentation. This duty involves documenting processes of GIS analysis and modeling for replication and transparency.

6.10.1 Produce documentation, given details about data access, possible data repairs, and data reliability, so that the organization and stakeholders have access to the analysis details.

(A) Requisite Knowledge. The organization's documentation guidelines; the GIS data access, extraction, and validation process; and the original scope and purpose of the GIS analysis request.

(B) Requisite Skills. The ability to communicate analysis details in technical writing techniques.

6.10.2 Compile analysis instructions, given the original request and technical notes, so that the organization has access to a transparent and reproducible record of the entire analysis process.

(A) Requisite Knowledge. The organization's documentation guidelines, the data analysis process for the current project, and the process to provide documentation.

(B) Requisite Skills. The ability to communicate the analysis process in writing, including organizing information chronologically.

Chapter 7 Business Analyst

7.1* General. A business analyst brings a strategic perspective and uses communication, problem-solving, facilitation, and management experience to help organizations develop efficient business solutions.

7.1.1 For qualification at business analyst, the candidate shall meet minimal education requirements and the JPRs defined in Sections 7.2 through 7.5.

7.1.2 General Prerequisite Knowledge. Project and program management; time management techniques; verbal and nonverbal communication techniques and relationship management strategies; meeting facilitation; basic survey methods; feedback processes and tools for evaluating team performance; and basic legal terminology and sources of applicable federal, tribal, territorial, state, provincial, local, and agency standards and legislation that could impact a project.

7.1.3 General Prerequisite Skills. The ability to communicate in writing using technology provided by the AHJ; interpret data and create presentations for a target audience; create appropriate charts, graphs, projections, and reports; and understand and communicate with people across different cultures.

7.2* Project/Program Management. This duty involves managing time facilitating teams and meetings, leading projects or programs to a successful conclusion; evaluating progress of the project or program; communicating with internal and external stakeholders; and reporting on an as-needed basis the progress being made with the project or program.

7.2.1 Develop a schedule of project tasks and activities, given project goals, priorities, and objectives, so that deadlines, goals, and outcomes are met.

(A)* Requisite Knowledge. Project and program management; and time management techniques, software, and systems.

(B) Requisite Skills. The ability to estimate workload distribution and time frames; evaluate project risk and anticipate delays; evaluate progress and adapt/adjust to align with available resources; and manage changes to the project scope, project schedule, and project costs using verification techniques.

7.2.2 Facilitate a team, given a group of team members/staff, so that coordination of meetings and project/program tasks are monitored, supported, documented, and evaluated against the agency's project goals.

(A) Requisite Knowledge. Tracking tools, spreadsheets, and process maps; verbal and nonverbal communication techniques and relationship management strategies; and feedback processes and tools for evaluating team performance.

(B)* Requisite Skills. The ability to develop spreadsheets, diagrams, and process maps; develop comprehensive project plans to be shared with clients or other staff members; delegate project tasks based on team strengths, skills, and experience levels; motivate colleagues; and communicate results and the required corrective actions with the project team, stakeholders, and management.

7.2.3 Evaluate project plans, given status updates and project metrics, so that recommendations can be developed to adjust objectives, tasks, and responsibilities as needed to meet goal(s) during each phase of the project.

(A)* Requisite Knowledge. Communication techniques, meeting facilitation, and basic survey methods.

(B)* Requisite Skills. The ability to collect oral and written input from stakeholders to facilitate the development of effective objectives, project requirements, and intended outcomes; and measure project performance using tools and techniques.

7.2.4* Coordinate internal and external reviews, given a project plan(s), so that the project risks are identified.

(A) Requisite Knowledge. Basic legal terminology and sources of applicable federal, tribal, territorial, state, provincial, local, and agency standards and legislation that could impact a project.

(B) Requisite Skills. The ability to communicate potential risks and requirements related to project documents, contracts, goals, and outcomes with the AHJ.

7.2.5 Create documentation of varied design and visualization, given project/program metrics, goals, and method of distribu-

tion, so that information is customized for a specified audience.

(A) Requisite Knowledge. Data visualization and report presentation that meet department policies and procedures and industry standards.

(B) Requisite Skills. The ability to summarize data and information into a variety of formats for publishing and presentation.

7.2.6 Assess project performance, given service level agreements and requirements, so that project tasks meet organizational goals and objectives.

(A) Requisite Knowledge. Common budgetary objectives/measures, financial analysis techniques, service level requirements, contract language, and legal terminology.

(B) Requisite Skills. The ability to review project budgets and plan needs to maintain project efforts within an established budget and approved schedule; report performance objectives to the governing body, grantor, and/or project proposal owner; and manage stakeholder priorities in a deadline-oriented environment.

7.2.7 Evaluate project/program progress, given department strategic initiatives, so that timelines are met in accordance with the agency's strategic vision.

(A)* Requisite Knowledge. Project management, improvement models, department specific strategic initiatives, and business strategy processes.

(B) Requisite Skills. The ability to work with groups and individuals to establish performance indicators or metrics aligned with adopted goals and objectives, and the ability to qualify/quantify and document success rates and progress metrics.

7.2.8 Complete a root cause analysis, given a set of department policies and procedures and industry standards, so that issues identified through the department's quality assurance or quality improvement process are corrected.

(A) Requisite Knowledge. Problem identification, and process improvement models.

(B) Requisite Skills. The ability to identify measures or indicators of system performance and the actions needed to improve or correct performance relative to the goals of the system, and to compile and analyze reports and statistical data to support recommendations for process improvement implementations.

7.2.9 Evaluate anomalies, given a set of data, so that data quality standards are applied.

(A) Requisite Knowledge. Statistical analysis methods, data normalization, and data structure; and data constraints and data quality assurance/quality improvement processes.

(B) Requisite Skills. The ability to identify gaps in data collection processes and understand and interpret data limitations and contextual dependencies in relational data systems.

7.2.10* Propose control methods, given a list of department data quality issues, so that department performance measures are accurate and align with goals and objectives.

(A)* Requisite Knowledge. Data quality evaluation and data quality management, business intelligence platforms and systems, and department goals and objectives.

(B) Requisite Skills. The ability to identify and create policies and procedures and data quality guidelines, and evaluate data needs and appropriate datasets within the business or organizational context.

7.2.11 Select an appropriate research design methodology, given an assignment, so that operational and administrative requests are investigated and evaluated.

(A) Requisite Knowledge. Qualitative and quantitative research; and descriptive, applied, and problem-oriented research methods.

(B) Requisite Skills. The ability to analyze and organize; design, evaluate, modify, and report results of programs and experiments based on hypotheses, goals, outcomes, controls, and variables; and use scientific rules and methods to solve problems.

7.2.12 Design a survey, given a list of department programs, so that stakeholder input can be obtained.

(A) Requisite Knowledge. Survey design and methods, terminology used in statistical analysis, and presentation tools.

(B) Requisite Skills. The ability to analyze and interpret the meaning of survey data, determine survey objectives, and suggest and test question wording.

7.2.13 Facilitate a group meeting, given a list of attendees, so that a task can be accomplished or information can be identified.

(A) Requisite Knowledge. Facilitation methodologies, communication techniques, and delegation.

(B) Requisite Skills. The ability to lead and facilitate the development and implementation of significant and focused process improvements across the organization.

7.3 Compliance Management. This duty involves conducting research; interpreting terms and conditions for achieving compliance; managing external relationships with accrediting, governing, or other third parties; and compiling requisite documentation to demonstrate compliance with established objectives.

7.3.1 Manage third-party relationships, given community expectations, service-level agreements, historical precedents, AHJ policies and procedures, department policies and procedures, and industry standards, so that the current and anticipated needs of the community are met and compliance with established parameters is verified.

(A) Requisite Knowledge. Policies and procedures, community expectations, historical performance, goals and objectives, automatic mutual aid parameters and performance, and service-level agreements.

(B) Requisite Skills. The ability to perform analysis, monitor performance, evaluate performance against stated goals and objectives, make public presentations, problem solve, and make recommendations.

7.3.2 Appraise standards established by third parties, given reviews of published requirements and observations of historical precedents, so that compliance with established parameters is verified.

(A) Requisite Knowledge. Policies and procedures, and gap analysis.

(B) Requisite Skills. The ability to make public presentations, interpret competencies and standards, problem solve, and analyze data.

7.3.3 Assess compliance with standards, given published requirements, quantitative and qualitative performance data, and observations of the AHJ's activities, so that gaps are identified and remedies are recommended, performance levels are documented, and compliance with established parameters is verified.

(A) Requisite Knowledge. Rules, regulations, standards, ordinances, policies, procedures, and community and department expectations.

(B) Requisite Skills. The ability to perform analysis, monitor performance, evaluate performance against stated goals and objectives, make public presentations, problem solve, and make recommendations.

7.3.4 Report compliance with contract conditions and established standards, given legal requirements, written conditions, observations of outcomes, and completion of deliverables, so that contractual obligations are met and compliance with established parameters is verified.

(A) Requisite Knowledge. Rules, regulations, ordinances, policies, procedures, community expectations, accepted accounting principles, and contract analysis and compliance.

(B) Requisite Skills. The ability to perform analysis, monitor performance, evaluate performance against stated outcomes and deliverables, make public presentations, and interpret contracts.

7.3.5* Perform a financial analysis, given program data, so that the project revenue is assessed and monitored.

(A) Requisite Knowledge. Rules, regulations, ordinances, policies, procedures, community expectations, accounting principles, contract analysis, and compliance.

(B) Requisite Skills. The ability to perform financial analysis, monitor performance, and evaluate performance against stated outcomes and deliverables.

7.4 Strategic Management. This duty involves facilitating the development and implementation of a community-driven strategic plan oriented towards emergency services and public safety, identifying community needs, determining prioritization of projects and programs, analyzing strategies to achieve organizational goals and objectives, and evaluating progress.

7.4.1 Summarize stakeholder input from internal and external sources, given quantitative and qualitative data from surveys, focus groups, direct correspondence, and other sources, so that the result aligns with the strategic vision, mission, plans, goals, and objectives, and its values reflect the needs of the community.

(A) Requisite Knowledge. Department response operations, policies, and legal requirements; and political, economic, and physical characteristics of the jurisdiction or service area.

(B) Requisite Skills. The ability to persuade stakeholders, identify necessary resources, and explain the policy development process; and the ability to use critical thinking and facilitating skills to accomplish gap analysis and risk assessments.

7.4.2 Interpret gaps in addressing community public safety risk and meeting community needs, given information provided by third parties, field observations by the AHJ, quantitative and qualitative performance data, subject matter expert opinions, industry best practices, and comparative examples, so that the result outlines strengths, deficiencies, and respective goals.

(A)* Requisite Knowledge. Gap analysis methods and processes; and department response operations, policies, and legal requirements.

(B) Requisite Skills. The ability to interpret qualitative and quantitative data, incorporate needs and requirements of diverse community groups and members, track and evaluate progress of risk reduction and operational programs/processes as they relate to ongoing risk assessment and community needs or gaps, and use critical thinking and facilitating skills to accomplish gap analysis and risk assessments.

7.4.3 Develop corrective actions in long-term planning, given gap analysis findings, so that the result addresses deficiencies and aligns with goals.

(A)* Requisite Knowledge. Gap analysis methods and processes; and department response operations, policies, and legal requirements.

(B) Requisite Skills. The ability to interpret and assess political and economic influences on strategic priorities, interpret quantitative and qualitative data, calculate budget impact, evaluate consequences of different options, apply cost-benefit analysis, and evaluate effectiveness, efficiency, and resiliency of operations and programs.

7.4.4 Establish processes and compliance procedures, given a strategic direction and conceptual goals and objectives, so that the agency can develop, document, and track strategic plans.

(A) Requisite Knowledge. Planning and goal progress tracking systems and processes.

(B) Requisite Skills. The ability to manage projects and track and monitor projects and strategic planning using a variety of tools and methods.

7.4.5 Develop organizational goals, given a list of strategic initiatives, in alignment with department policies and procedures and industry standards so that objectives and critical tasks are defined.

(A)* Requisite Knowledge. Common methods to design effective goals and objectives.

(B) Requisite Skills. The ability to persuade stakeholders, identify necessary resources, and explain the policy development process.

7.4.6 Analyze progress and performance, given established benchmarks, so that tasks are completed within time and fiscal-based parameters.

(A) Requisite Knowledge. Compliance methods and performance tracking procedures, and budgeting and finance practices.

(B) Requisite Skills. The ability to prioritize and adjust goals and deadlines based on the environment and resources available, facilitate progress of goals and objectives, and assess and validate statistical information and data related to program areas.

7.4.7* Conduct a cost-benefit analysis, given department response data, capital asset information, service area demographics, and department financial data, so that the budget impact of decisions are evaluated.

(A) Requisite Knowledge. Basic accounting and financial systems, procurement processes and legal requirements, and contract management and crisis management procedures.

(B) Requisite Skills. The ability to understand external funding sources, document financial expenditures incurred as a result of an incident and for compiling claims for future cost recovery, identify and access alternative funding sources, and manage budgeted and specially appropriated funds.

7.4.8 Present the results of a cost-benefit analysis, given a cost-benefit analysis, so that recommendations are prioritized for decision makers.

(A) Requisite Knowledge. Basic accounting and financial systems, procurement processes and legal requirements, contract management and crisis management procedures, and presentation and visualization tools.

(B) Requisite Skills. The ability to understand external funding sources, document financial expenditures incurred as a result of an incident and for compiling claims for future cost recovery, identify and access alternative funding sources, and manage budgeted and specially appropriated funds.

7.5 Policy Analysis. This duty involves evaluating, interpreting, and implementing policy; researching and conducting gap analysis; and coordinating stakeholder feedback.

7.5.1 Evaluate policies that impact service delivery, given policies and service delivery objectives, so that recommendations to strategic and operational oversight are provided.

(A) Requisite Knowledge. Department operations and applicable legal requirements.

(B) Requisite Skills. The ability to observe and recognize problems.

7.5.2 Interpret legal and regulatory requirements, given requirements by the AHJ, so that policies do not contradict each other and are compliant with department, legal, and regulatory requirements.

(A) Requisite Knowledge. Applicable legal requirements, regulatory requirements, and policy development process.

(B) Requisite Skills. The ability to interpret legal requirements and explain the policy development process.

7.5.3 Compile research and information, given a subject, direction, defined parameters, and the desired end-state, so that the necessary information is provided for management to evaluate options in support of policy proposals.

(A) Requisite Knowledge. Department operations, and types and sources of publications.

(B) Requisite Skills. The ability to identify reliable information, devise means to collect data, interpret quantitative and qualitative data, analyze results of other departments' decisions, and conduct research.

7.5.4 Evaluate policies, given policies and an identified gap, shortfall, or need, so that the effectiveness of the policy is measured and issues are addressed.

(A) Requisite Knowledge. Department operations and policies, and applicable legal requirements.

(B) Requisite Skills. The ability to interpret quantitative and qualitative data, calculate budget impact, evaluate consequences of different options, and apply cost-benefit analysis.

7.5.5 Coordinate policy implementation strategies, given new or updated policies, so that timelines, policy requirements, and obstacles are addressed.

(A) Requisite Knowledge. Department operations and applicable legal requirements, and department policies.

(B) Requisite Skills. The ability to persuade stakeholders, identify necessary resources, and explain the policy development process.

7.5.6 Attain stakeholder support for policy change, given new or updated policies, so that timelines, policy requirements, and obstacles are addressed.

(A) Requisite Knowledge. Department operations and applicable legal requirements, and department policies.

(B) Requisite Skills. The ability to exercise interpersonal skills, problem solve, and apply cost-benefit analysis.

7.5.7 Evaluate the impact of a department's policy(s), given policy requirements and the desired outcomes, so that each policy's effectiveness can be measured and positive and negative outcomes are identified.

(A) Requisite Knowledge. Department operations and applicable legal requirements.

(B) Requisite Skills. The ability to compile stakeholder feedback, interpret quantitative and qualitative data, apply risk-benefit analysis, and project future trends.

Chapter 8 Data and Analytics Manager

8.1 General. For qualification as data and analytics manager, the candidate shall meet the requirements as defined in Sections 8.2 through 8.7 of this standard.

8.1.1* General Prerequisite Knowledge. The organizational structure of the department; geographical configuration and characteristics of response districts; departmental operating procedures for administration and operations, emergency and nonemergency operations, and incident management system and safety; fundamentals of leadership; departmental budget process; information management and record keeping; the fire prevention and building safety codes and ordinances applicable to the jurisdiction; current trends, technologies, and socioeconomic and political factors that affect the fire service; the cultural diversity and demographic makeup of the workforce and community; methods used by supervisors to obtain cooperation within a group of subordinates; management and employee rights; agreements in force between the organization and members; generally accepted ethical practices, including a professional code of ethics; and policies and procedures regarding the operation of the department as they involve supervisors and members.

8.1.2 General Prerequisite Skills. The ability to communicate in writing using technology provided by the AHJ; create reports, letters, and memorandums; and operate in an informa-

tion management system so that expectations and accountability are unambiguous.

8.2 Management and Administration. This duty involves using member resources to accomplish assignments and supervising personnel during work periods.

8.2.1 Assign tasks or responsibilities to members, given an assignment, so that the instructions are complete, clear and concise and the desired outcomes are conveyed.

(A) Requisite Knowledge. Verbal communications, characteristics of leadership, techniques used to make assignments under stressful situations, methods of confirming understanding, and standard operating procedures (SOPs).

(B) Requisite Skills. The ability to condense instructions for frequently assigned tasks based on SOPs.

8.2.2 Create an action plan, given department policies and procedures, so that performance issues related to an employee's task completion, interpersonal relationships, and behavioral health can be supported through coaching and employee assistance programs (EAPs), or modified through corrective action.

(A) Requisite Knowledge. Indicators and potential causes of performance issues; adverse effects of stress on the performance of personnel; situations requiring member assistance, coaching, or discipline; the employee guidelines, EAP, policies, and procedures; and awareness of AHJ member-assistance policies and procedures.

(B) Requisite Skills. The ability to communicate orally and in writing department policies, procedures related to human resources, applicable laws, and legal concepts; and demonstrate emotional intelligence.

8.2.3 Implement an action plan, given an identified performance issue, so that the performance issue can be supported through coaching or EAP, or modified through corrective action.

(A) Requisite Knowledge. Department policies, procedures, applicable laws, and legal concepts; indicators and potential causes of performance issues; adverse effects of stress on the performance of personnel; situations requiring member assistance, coaching, or discipline; the employee guidelines, policies, and procedures; and awareness of AHJ member-assistance policies and procedures.

(B) Requisite Skills. The ability to communicate orally and in writing department policies, procedures related to human resources, applicable laws, and legal concepts; and demonstrate emotional intelligence.

8.2.4 Coordinate the completion of assigned tasks and projects, given a list of projects, tasks, and the job requirements, so that the assignments are prioritized, a plan for the completion of each assignment is developed, and members are held accountable for the completion of the assigned tasks.

(A) Requisite Knowledge. Principles of project management and basic human resource management.

(B) Requisite Skills. The ability to plan and set priorities.

8.2.5 Evaluate policies, given department goals, priorities, and identified gaps, so that business processes are compliant with current organizational and industry standards.

(A) Requisite Knowledge. Written and oral communication, organizational goals, organizational polices/procedures, applicable legal requirements, existing contract terms, and how to conduct cost-benefit analysis.

(B)* Requisite Skills. The ability to revise, develop, or eliminate policy; demonstrate emotional intelligence; and communicate change in a positive manner.

8.2.6* Execute administrative functions, given current department policies and procedures, so that outputs are maintained in accordance with policies and procedures.

(A) Requisite Knowledge. Administrative policies and procedures, records management processes, department policies and procedures, and reporting requirements.

(B) Requisite Skills. The ability to communicate orally and in writing administrative policies and procedures, records management processes, department policies and procedures, and reporting requirements.

8.2.7 Develop a divisional or departmental budget, given schedules and guidelines so that capital, operating, and personnel costs are quantifiable and justified.

(A) Requisite Knowledge. The supplies and equipment necessary for ongoing or new projects; schedule and cost of planned repairs and updates to existing facilities; new equipment, apparatus maintenance, and personnel costs; and budgeting tools.

(B) Requisite Skills. The ability to allocate finances, to relate interpersonally, and to communicate, both orally and in writing, the needs of the data program, budget schedules, and guidelines.

8.2.8 Prepare a budget request, given a need and budget forms, so that the information provided fulfills the requestor's need.

(A) Requisite Knowledge. Department policies and procedures, revenue sources, budget form(s), and budget process(es).

(B) Requisite Skills. The ability to communicate orally and in writing the budgetary needs of the data program.

8.2.9 Integrate the process of purchasing, including soliciting and awarding bids, given established specifications, so that the needs of the organization are met within the applicable federal, tribal, territorial, state, provincial, and local laws and regulations, and competitive bidding is ensured.

(A) Requisite Knowledge. Purchasing laws, regulations, policies, and procedures.

(B) Requisite Skills. The ability to use evaluative methods and communicate orally and in writing the evaluative methods used for purchasing.

8.2.10 Manage the development and execution of corrective actions that address failures to comply with contracts, given a contract, the desired outcomes and deliverables, jurisdictional requirements, and accounting principles, so that fiscal standards are maintained, performance outcomes are met, and contract terms delivered.

(A) Requisite Knowledge. Rules, regulations, ordinances, policies, procedures, community expectations, accounting principles, and contract analysis and compliance.

(B) Requisite Skills. The ability to monitor and evaluate performance of the contractor against stated outcomes and deliverables, communicate orally and in writing the results of monitoring and evaluation of the contract, make public presentations, and interpret contracts.

8.3 Project/Program Management. This duty involves managing multiple programs or projects conducted by analysts assigned to the manager, supervising the analysts who are conducting analysis and assessing areas for process improvement, and developing plans and processes for prioritization of projects based on organizational needs.

8.3.1 Coordinate project volume, given goals, short- and long-range plans, current budget documents, and identified organizational needs, so that multiple projects can be managed simultaneously.

(A) Requisite Knowledge. Tracking tools and process maps, oral and written communication techniques, relationship management strategies, and feedback processes and tools to evaluate team performance.

(B)* Requisite Skills. The ability to develop comprehensive project plans; delegate project tasks based on team strengths, skills, and experience levels; motivate colleagues; communicate results and the required corrective actions with the project team, stakeholders, and management; and delegating responsibilities to the appropriate parties.

8.3.2 Create a strategic plan for information technology and data projects, given short- and long-range plans, the current budget, and identified organizational needs, so that departmental data and technology needs are met.

(A) Requisite Knowledge. Strategic planning, project management tools, process maps, oral and written communication techniques, relationship management strategies, feedback processes, and tools to evaluate team performance.

(B)* Requisite Skills. The ability to develop comprehensive project plans; delegate project tasks based on team strengths, skills, and experience levels; motivate colleagues; communicate results and the required corrective actions with the project team, stakeholders, and management; delegate responsibilities to the appropriate parties.

8.3.3 Develop a process for analyzing and assessing risks to multiple projects, given project goals, timelines, and benchmarks, so that critical obstacles can be identified and resolved.

(A) Requisite Knowledge. Project requirements and intended outcomes, and organization and stakeholder priorities.

(B) Requisite Skills. The ability to identify and analyze risks, resolve conflict, and execute change management.

8.3.4 Evaluate the project plans, tasks, and responsibilities, given a project's current status, statement of work, and work phases, so that milestones are adjusted and project goals are met.

(A) Requisite Knowledge. Communication techniques, meeting facilitation, and basic survey methodologies.

(B) Requisite Skills. The ability to collect oral and written input from stakeholders for the creation of measurable objectives, project requirements, and intended outcomes; and measure project performance using appropriate tools and techniques.

8.4 Performance Evaluation. This duty involves evaluating member performance according to their job description requirements.

8.4.1 Evaluate the job performance of assigned staff, given evaluation criteria and forms, so that each member's performance is evaluated and reported according to department policies and procedures.

(A) Requisite Knowledge. Department policies and procedures related to human resources, job descriptions, objectives of a member evaluation program, and common errors in evaluating.

(B) Requisite Skills. The ability to communicate orally and in writing members' performance, adherence to human resource policies and procedures, and members' performance related to department key performance indicators (KPIs); and plan and conduct evaluations.

8.4.2 Create a professional development plan for a member of the organization, given the requirements for promotion, so that the individual acquires the necessary knowledge, skills, and abilities to be eligible for the examination or promotion process.

(A) Requisite Knowledge. Components and process of creating a professional development guide and job shadowing process, job descriptions, minimum requirements of target positions, and elements and practices of coaching and mentoring.

(B) Requisite Skills. The ability to communicate orally and in writing a professional development guide and job shadowing process, job descriptions, and minimum requirements of target positions.

8.5* Data Governance and Management. This duty involves researching, developing, and documenting methods for data quality, analysis, manipulation, transformation, authentication, and exclusion criteria.

8.5.1 Provide quality assurance (QA) review on all data inputs, given approved data entry tools, data structures, and samples of transformed data, so that transformed data can be assessed for errors and validated.

(A) Requisite Knowledge. Content of data sources, database schema, data relationships; an understanding of outliers and deviations from norms or normally distributed data; and the ability to efficiently locate data quality issues in a large or small dataset.

(B) Requisite Skills. The ability to direct changes or processes related to data systems; implement and document controls for anomalous or erroneous data in a given dataset; examine data to determine the completeness of the data, data relevancy related to multiple datasets, and the timeliness of the data that is being reported; and communicate orally and in writing process and workflow with internal team members, stakeholders, and vendors.

8.5.2 Assess data systems, given department policies and procedures and industry standards, so that the quality of the data ecosystem is reliable.

(A) Requisite Knowledge. Methods and concepts of extract, transform, load (ETL), data architecture, and data ecosystems.

(B) Requisite Skills. The ability to analyze and reason, and summarize and communicate orally and in writing complex information.

8.5.3 Develop data quality criteria, given the needs and goals of the organization, so that the accuracy, completeness, timeliness, and consistency of data are defined.

(A) Requisite Knowledge. Data QA and quality control industry standards, organizational goals, performance measures, data terms, data definitions, data architecture, acceptable data values, and data processes.

(B) Requisite Skills. The ability to communicate orally and in writing the procedures related to data quality criteria and metrics; analyze and solve problems; confront challenging issues in a productive manner; create buy-in for quality initiatives; define the business goals for data quality improvements; identify who the data stakeholders are, what business processes are impacted, and the rules being applied to the data; conduct QA; and review techniques, such as limits evaluation, sampling, and drill-down analysis.

8.5.4 Design a data quality and assurance plan, given the department's current data quality criteria, so that all data complies with the quality standards.

(A) Requisite Knowledge. Data quality assurance processes and procedures, organizational goals, performance measures, data definitions, data architecture, and acceptable data values.

(B) Requisite Skills. The ability to communicate orally and in writing data QA procedures; analyze and solve problems; confront challenging issues in a productive manner; create buy-in for quality initiatives; design and implement a data QA program that incorporates steps for definitions, assessments, analyses, improvements, implementation, and controls.

8.5.5 Devise performance improvement initiatives, given the department's data quality criteria, so that control methods for data quality issues are developed.

(A) Requisite Knowledge. Data quality assurance and quality control industry standards, organizational goals, performance measures, data definitions, data architecture, and acceptable data values.

(B) Requisite Skills. The ability to communicate orally and in writing data quality procedures, analyze and solve problems, confront challenging issues in a productive manner, and create buy-in for quality initiatives.

8.6 Communication. This duty involves communicating quantitative and qualitative data, results of data analysis, and performance metrics to department leadership, elected officials, and other community stakeholders.

8.6.1 Develop a plan to get input from the members of the department and the community, given the organization's strategic goals, approved policies and procedures, and events calendar, so that community needs are being met by the organization.

(A) Requisite Knowledge. Organizational goals, community expectations, policies and procedures, benchmarks, and performance measures.

(B) Requisite Skills. The ability to communicate orally and in writing the organization's strategic goals, participate in strategic planning, and provide customer service.

8.6.2 Participate in meetings with elected and appointed leadership, department administration, operational department members, supporting department members, and community members, given community feedback about priorities, expectations, concerns, and comments, so that the needs of the department and community are understood and the requirements for the data analysis team are communicated.

(A) Requisite Knowledge. Organizational structure, organizational goals, local community leaders, community expectations, community demographics, community needs, policies and procedures, and current community issues.

(B) Requisite Skills. The ability to explain legal and technical requirements, make public presentations, and resolve conflict.

8.7 Manage the Compliance Management Process. This duty involves managing the compliance processes for contracts, formal agreements, recognized standards, accreditation, and regulations and requirements of the governing body; and administering the research needed to achieve compliance.

8.7.1 Lead the management and evaluative processes related to external relationships, given community expectations, departmental policies and procedures, historical precedents, and service-level agreements, so that the needs of the community are met, and the relationships conform to agreed-on parameters.

(A) Requisite Knowledge. Policies and procedures, community expectations, historical performance, goals and objectives, automatic mutual aid parameters, and performance.

(B) Requisite Skills. The ability to provide guidance to members conducting performance analysis, monitor performance, evaluate performance against stated goals and objectives, make public presentations, problem solve, and make recommendations.

8.7.2* Implement a compliance plan, given department policies and procedures and industry standards, so that processes meet the requirements of the applicable industry standards, accreditation, and/or regulations and requirements of the governing body.

(A) Requisite Knowledge. Policies and procedures, and industry standards related to gap analysis.

(B) Requisite Skills. The ability to communicate orally and in writing the compliance plan and identified gaps, interpret the applicable industry standards, make public presentations, interpret competencies and standards, problem solve, and analyze data.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials nor does it approve or evaluate testing laboratories. In determining the acceptability of installations or procedures, equipment, or materials, the "authority having jurisdiction" may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The "authority having jurisdiction" may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA standards in a broad manner because jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.4 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.9 Data Visualization. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data.

A.3.3.14 Dynamic Content. A common example of a dynamic visualization is a web-based interactive dashboard. Html, js, and java are examples of programming languages that enable users to create dynamic visualizations.

A.3.3.23 Metadata. Metadata can include date/time, origin, standards, and other relevant information.

A.3.3.26 Outlier. This definition leaves it up to the analyst (or a consensus process) to decide what will be considered abnormal. Before abnormal observations can be singled out, it is necessary to characterize normal observations.

A.3.3.30 Process Map. Using process mapping software, process maps show a series of events that produce an end result.

A.3.3.31 Program. See A.7.2.

A.3.3.32 Project. See A.7.2.

A.3.3.41 Schema. In a relational database, the schema defines the tables, the fields in each table, the relationships between fields and tables, and the grouping of objects within the database. Schemas are generally documented in a data dictionary. A database schema provides a logical classification of a database object.

A.3.3.46 Static Content. A common example of static content is a single-page layout like an infographic. Other examples include scale, date, and version.

A.3.3.48 Tabular Data. These data can include apparatus and incident types, dates and timestamps, personnel information, and so forth.

A.4.1 This chapter has been developed to support the building of an analyst's awareness and ability to apply respective knowledge and skills to a fire and emergency services context to guide organizational decision-making.

A.4.3.3 Equipment on the engine company could include, but not be limited to, the pump, water tank, ground ladders, and hose.

A.4.3.5 Equipment on the ladder company could include, but not be limited to, the ground ladders, aerial device, forcible entry equipment, and ventilation tools. It is possible that a fire department might not have a physical ladder truck/aerial device. However, this does not mean that "ladder truck" work is not performed. Departments should consider instructing fire and emergency services analysts on truck operations as it represents a series of critical fireground tasks.

A.4.3.7 Equipment on the ambulance(s) could include, but not be limited to, patient transport equipment, immobilization equipment, patient assessment equipment, and medications.

A.4.3.10 The number and types of special companies that fire departments maintain are wide and varied across the industry. Similarly, how these apparatus and vehicles are staffed and deployed also varies from jurisdiction to jurisdiction. The AHJ should identify these special companies and develop educational content to familiarize newly hired fire and emergency services analysts with the knowledge required to perform their analysis. Such special companies could include, but are not limited to, brush trucks, technical rescue teams, marine units, community paramedic services, ARFF teams, and hazmat teams.

A.4.4 For more information on firefighter safety and health see NFPA 1500™.

A.4.4.3 Firefighter PPE includes, but is not limited to, helmet, structure fire protective ensemble, self-contained breathing apparatus (SCBA), body substance isolation PPE for EMS response, and hazardous material suits.

A.4.5.1 Dynamics of fire growth and development include, but are not limited to, physical and chemical changes, modes of combustion, the fire triangle, the fire tetrahedron, heat, sources of heat, transmission of heat, passive agents, fuel, oxygen, and products of combustion.

A.4.5.3 Development of fire in a compartment includes, but is not limited to, incipient stage, growth stage, thermal layering, rollover, flashover, fully developed stage, decay stage, consumption of fuel, limited ventilation, and backdraft.

A.4.5.4 Stages of fire control include, but are not limited to, temperature reduction, fuel removal, and oxygen exclusion.

A.4.6.1 Extra attention should be paid to the particular types of building construction found within the organization's jurisdiction.

A.4.7.8 Tactics include, but are not limited to, the responsibilities of the first- and second-due engine companies, fireground support companies, forcible entry, rapid intervention crews, building access, ventilation and fire control, search and rescue, fires in upper floors, and belowgrade fires.

A.4.9.1 Equipment includes, but is not limited to, powered hydraulic equipment, manual hydraulic tools, pneumatic tools, jacks, cribbing, reciprocating saws, circular saws, chains, pullies, levers, and ropes.

A.4.12 For more information on community risk reduction see NFPA 1300.

A.4.12.3.2 At a minimum, the member should be familiar with the five "Es" of community risk reduction, which are education, enforcement, engineering, emergency response, and economic incentive.

A.5.2.2(A) See A.6.2.2 for examples of data sources.

A.5.2.2(B) In this context, data management software refers to any software that can be used to access and at least preview data.

A.5.2.3(A) Examples of data types include date vs. datetime and int vs. decimal.

A.5.3.1 Potential issues in this context refers to situations such as duplications, lost data, or mistranslated data, and so forth, after consolidating partial information from multiple data sources or converting data from one program language to another.

A.5.3.2(A) An example of common data results includes NULL vs. empty values.

A.5.4.1(A) Examples include knowing who can alter a report and knowing a fire service casualty report is required if a fire service injury or death is reported.

A.5.4.1(B) An incident report is an example of a whole dataset that could be impacted by making changes to the data.

A.5.5.1 The candidate accomplishing this task needs to demonstrate that they are complying with the agency's data conventions.

One example of standardizing format would be to ensure dates are all mm/dd/yyyy vs. yyyy/mm/dd.

A.5.5.2 An example of structuring data is arranging consolidated information from multiple data sources and limiting the output to only what is required for analysis to improve analytical performance. A request for information on cooking fires in the last year does not require information on cooking fires from 10 years ago.

A.5.6.2 Analytic tools feature calculation or computation capabilities that have functions to help answer statistical questions. These tools might also create data visualizations like charts and graphs and allow for custom programming and management. Examples of analysis results include observations, trends, conclusions, or items requiring further analysis.

A.5.6.3 See the definition of quality assurance (QA) in 3.3.36.

A.5.7.1(A) The member should consider the audience to include people with low technical proficiency and people with little or no background in the fire service.

A.6.1 Spatial data describe the location, size, and/or shape of an object in space. These data can include road systems (roads, bridges, tunnels, etc.), man-made structures, geographic features (mountains, plains, rivers, lakes, etc.), jurisdictional boundaries, and so forth. Spatial data include geometry to locate the object but also tabular data attributable to the object.

A.6.2.1 Examples of sources include fire and emergency services department records management systems (RMS), computer-aided dispatch systems (CAD), and nonfire and emergency services department resources.

A.6.2.2 Examples of data sources include fire and emergency services department records management systems (RMS), computer-aided dispatch systems (CAD), and nonfire and emergency services department resources.

A.6.3.1 Before specific analysis can be conducted, it must be confirmed that the data format is valid. For example, confirm that buildings are not placed incorrectly such as being in lakes/rivers, that boundary files do not have self-intersections, or that distances between objects are of the correct magnitude and units.

A.6.3.3 Methods to assess credibility of data include reviewing data source (national, regional, and municipality governments, affiliated agencies, research institutions, and international organizations are some examples of reliable data sources), completeness (minimal amount of missing data), precision (degree of detail), accuracy, and recency (up to date).

A.6.4.1 Examples of spatial data formats include vector, raster, geoJSON, shapefile, KML, among others.

A.6.4.3 Examples of spatial data properties include reference source database, attributes, coordinate projection, unit of measure, spatial extent, current symbology, and labeling.

A.6.5.3 Examples of feature layer properties are transparency, symbology, visualization, labeling of features, and attribute field information.

A.6.5.4 Examples include details and descriptions for use, restriction, credit attribution, spatial extent, geographic and tabular properties, and attribute descriptions. Stakeholders include individuals who might analyze, edit, interact, modify, present, or view the data. Stakeholders could be colleagues (data and business analyst or manager) who will use the data, decision makers, and the general public.

A.6.6.2 Examples of location attribution are coordinate values, an address, or a place name.

A.6.6.3 An example of a tool is combining several geoprocessing steps into one function. An example of a model is applying an algorithm to data to produce new information.

A.6.7.1 Examples of response objectives are outlined in 4.1.2.1, 5.2.4.1, 5.2.4.2, 5.2.4.3, and 5.2.4.4 of NFPA 1710.

Examples of provided data include administrative or jurisdictional boundaries and transportation, staffing, and deployment configuration.

A.6.7.2 Examples of resources are apparatus, personnel, and stations.

A.6.7.3 NFPA 1300 outlines the process to identify and analyze community risk.

A.6.7.4 Statistical analysis is the process of analyzing data and using statistical methods to identify patterns and trends to make informed decisions.

A.6.8.5 For more information regarding uncertainty, see *Simple Guide for Evaluating and Expressing the Uncertainty of NIST Measurement Results* (Possolo 2015).

A.6.9.2 Examples of metadata are projection, sources, and creator.

A.7.1 The business analyst will use various data types; however, they are not the primary creator or manager of the organization's data (spatial or otherwise). The business analyst will collaborate with data and GIS analysts to operationalize data-driven insights into business processes and policy.

The primary areas of expertise for the business analyst include the analysis and contextualization of business processes, coordinating cross-functional teams, researching industry trends and requirements, overseeing the implementation of new policies and procedures, and implementing effective solutions to business problems.

A.7.2 A program and a project are both terms commonly used in the field of management, but they have distinct differences:

Definition:

Program: A program is a collection of related projects, activities, and resources that are managed in a coordinated manner to achieve specific strategic objectives or outcomes.

Project: A project is a temporary endeavor with a defined beginning and end, undertaken to create a unique product, service, or result.

Scope:

Program: A program is broader in scope and encompasses multiple projects, which are interrelated and contribute to a common goal.

Project: A project has a specific scope, objectives, and deliverables that need to be achieved within a defined time frame.

Duration:

Program: Programs are typically long-term initiatives that can span several years or even decades.

Project: Projects are temporary in nature and have a defined duration, ranging from a few weeks to a few years.

Complexity:

Program: Programs are often more complex than individual projects as they involve managing multiple projects, stakeholders, and resources simultaneously.

Project: Projects can vary in complexity, but they are generally more focused and manageable compared to programs.

Management Approach:

Program: Programs require a strategic management approach, focusing on alignment with organizational goals, resource allocation, and coordination among various projects.

Project: Projects require a tactical management approach, emphasizing planning, execution, monitoring, and control of specific tasks and deliverables.

Outcome:

Program: Programs aim to achieve strategic outcomes or benefits that are aligned with the organization's overall objectives.

Project: Projects aim to deliver specific products, services, or results as defined in the project scope.

A.7.2.1(A) See A.7.2.

A.7.2.2(B) Colleagues include peers, subordinates, and partners.

A.7.2.3(A) To learn more about survey methods, see https://www.surveylegend.com/types-of-surveys/types-of-survey-methods/ (Mahmutovic 2023).

A.7.2.3(B) Examples of performance management tools include Agile, balance scorecard, key performance indicators (KPIs), earned value management, Gantt charts, and feedback surveys.

A.7.2.4 Examples of project risks include legal, financial, and contractual risk.

A.7.2.7(A) Examples of business strategy processes are Agile, Waterfall, Scrum, Lean, and Kanban.

A.7.2.10 Data control methods ensure data are reliable, accurate, and fit for the intended purpose; examples include the following: data profiling (data profiling tools), data cleansing, data validation, data standardizations, data monitoring, data auditing, data integration, and data quality metrics.

A.7.2.10(A) Examples of data quality evaluation and data quality management are completeness, uniqueness, consistency, accuracy, and timeliness.

A.7.3.5 Examples of program data used to create financial reports include emergency medical service (EMS) billing, inspections fees, permit fees, fire assessment fees and taxes, service fees, and levy rates.

Examples of financial analysis deliverables include financial reports on collections, levies, grants, fees, and billing projections.

A.7.4.2(A) Examples of gap analysis methods and processes are SWOT, SOAR, and PEST.

A.7.4.3(A) Examples of gap analysis methods and processes are SWOT, SOAR, and PEST.

A.7.4.5(A) Examples of gap analysis methods and processes are SWOT, SOAR, and PEST.

A.7.4.7 Examples of financial data include financial statements, tax records, finance forecasts, financial ratios, fund/grant balance sheets, income statements, budget records, and capital asset budgets.

A.8.1.1 It is important for the data and analytics manager to have a detailed understanding of all aspects of fire department operations and administration. This experience can be gained through formal training or demonstrated experience in fire department operations and administration. It is not required for the data and analytics manager to be serving, have previously served, or be qualified or certified as a firefighter, fire officer, or other operational roles within the fire department.

A.8.2.5(B) For testing and evaluation information see The Emotional Quotient Inventory 2.0 (EQ-i 2.0). Developed from 20 years of global research, this test was the first scientifically validated EI assessment and is now the most extensively used worldwide. EQ-i 2.0 is available through various psychological and educational websites.

A.8.2.6 The local organization and/or AHJ determines the administrative functions.

A.8.3.1(B) Colleagues include peers, subordinates, and partners.

A.8.3.2(B) Colleagues include peers, subordinates, and partners.

A.8.5 For more information on the concepts in this section, see *Disrupting Data Governance* (Madsen 2019); *Data Governance: How to Design, Deploy and Sustain an Effective Data Governance Program* (Ladley 2012); or *Data Stewardship: An Actionable Guide to Effective Data Management and Data Governance* (Plotkin 2013).

A.8.7.2 Applicable industry standards include those developed and published by Accreditation, the International Organization for Standardization (ISO), and the National Emergency Medical Services Information System (NEMSIS).

Annex B Explanation of the Professional Qualifications Standards and Concepts of JPRs

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1 Explanation of the Professional Qualifications Standards and Concepts of Job Performance Requirements (JPRs). The primary benefit of establishing national professional qualifications standards is to provide both public and private sectors with a framework of the job requirements for emergency services personnel. Other benefits include enhancement of the profession, individual as well as organizational growth and development, and standardization of practices.

NFPA professional qualifications standards identify the minimum job performance requirements (JPRs) for specific emergency services levels and positions. The standards can be used for training design and evaluation, certification, measuring and critiquing on-the-job performance, defining hiring practices, job descriptions, and setting organizational policies, procedures, and goals.

Professional qualifications standards for specific jobs are organized by major areas of responsibility defined as *duties*. For example, the firefighter's duties might include fire department communications, fireground operations, and preparedness and maintenance, whereas the fire and life safety educator's duties might include education and implementation, planning and development, and evaluation. Duties are major functional areas of responsibility within a specific job.

The professional qualifications standards are written as JPRs. JPRs describe the performance required for a specific job and are grouped according to the duties of the job. The complete list of JPRs for each duty defines what an individual must be able to do in order to perform and achieve that duty.

B.2 The Parts of a JPR.

B.2.1 Critical Components. The JPR comprises three critical components, which are as follows:

(1) Task to be performed, partial description using an action verb *(See Figure B.2.1 for examples of action verbs used in the creation of JPRs.)*
(2) Tools, equipment, or materials that are to be provided to complete the task
(3) Evaluation parameters and performance outcomes

Table B.2.1 gives an example of the critical components of a JPR.

Table B.2.1 Example of a JPR

(1) Task to be performed	(1) Overhaul a fire scene,
(2) Tools, equipment, or materials	(2) given PPE, attack line, hand tools, flashlight, and an assignment,
(3) Evaluation parameters and performance outcomes	(3) so that structural integrity is not compromised, all hidden fires are discovered, fire cause evidence is preserved, and the fire is extinguished.

B.2.1.1 The Task to Be Performed. The first component is a concise statement of what the person is required to do. A significant aspect of that phrase is the use of an action verb, which sets the expectation for what is to be accomplished.

B.2.1.2 Tools, Equipment, or Materials That Should Be Provided for Successful Completion of the Task. This component ensures that all the individuals completing the task are given the same tools, equipment, or materials when they are being evaluated. Both the individual and the evaluator will know what should be provided in order for the individual to complete the task.

B.2.1.3 Evaluation Parameters and Performance Outcomes. This component defines — for both the performer and the evaluator — how well the individual should perform each task. The JPR guides performance toward successful completion by identifying evaluation parameters and performance outcomes. This portion of the JPR promotes consistency in evaluation by reducing the variables used to gauge performance.

B.2.2 Requisite Knowledge and Skills. In addition to these three components, a JPR describes requisite knowledge and skills. As the term *requisite* suggests, these are the necessary knowledge and skills the individual should have prior to being able to perform the task. Requisite knowledge and skills are the foundation for task performance.

B.2.3 Examples. With the components and requisites combined, a JPR might be similar to the two examples in B.2.3.1 and B.2.3.2.

B.2.3.1 Example: Firefighter I. Overhaul a fire scene, given PPE, attack line, hand tools, flashlight, and an assignment, so that structural integrity is not compromised, all hidden fires are discovered, fire cause evidence is preserved, and the fire is extinguished.

(A) Requisite Knowledge. Types of fire attack lines and water application devices for overhaul, water application methods for extinguishment that limit water damage, types of tools and methods used to expose hidden fire, dangers associated with overhaul, signs of area of origin or signs of arson, and reasons for protection of fire scene.

(B) Requisite Skills. The ability to deploy and operate an attack line; remove flooring, ceiling, and wall components to expose void spaces without compromising structural integrity; apply water for maximum effectiveness; expose and extinguish hidden fires in walls, ceilings, and subfloor spaces; recognize and preserve signs of area of origin and arson; and evaluate for complete extinguishment.

B.2.3.2 Example: Fire and Life Safety Educator II. Prepare a written budget proposal for a specific program or activity, given budgetary guidelines, program needs, and delivery expense projections, so that all guidelines are followed, and the budget identifies all program needs.

(A) Requisite Knowledge. Budgetary process; governmental accounting procedures; federal, state, and local laws; organizational bidding process; and organization purchase requests.

(B) Requisite Skills. Estimate project costs; complete budget forms; requisition/purchase orders; collect, organize, and format budgetary information; complete program budget proposal; and complete purchase requests.

B.3 Potential Uses for JPRs.

B.3.1 Certification. JPRs can be used to establish the evaluation criteria for certification at a specific job level. When used for certification, evaluation should be based on the successful completion of JPRs.

The evaluator would verify the attainment of requisite knowledge and skills prior to JPRs evaluation. Verification could be through documentation review or testing.

The individual seeking certification should be evaluated on the completion of the JPRs. The individual should perform the task and be evaluated based on the evaluation parameters and performance outcomes. This performance-based evaluation is based on practical exercises for psychomotor skills and written examinations for cognitive skills.

Psychomotor skills are those physical skills that can be demonstrated or observed. Cognitive skills cannot be observed but rather are evaluated on how an individual completes a task (process-oriented) or a task's outcome (product-oriented).

Performance evaluation requires that individuals be given the tools, equipment, or materials listed in the JPRs in order to complete the task.

Table B.3.1 provides examples of how assessment methodologies can be utilized by a certifying body.

B.3.2 Curriculum Development and Training Design and Evaluation. The statements contained in this document that refer to job performance were designed and written as JPRs. Although a resemblance to instructional objectives might be present, these statements should not be used in a teaching situation until after they have been modified for instructional use.

JPRs state the behaviors required to perform specific skills on the job, as opposed to a learning situation. These statements should be converted into instructional objectives with behaviors, conditions, and the degree to be measured within the educational environment.

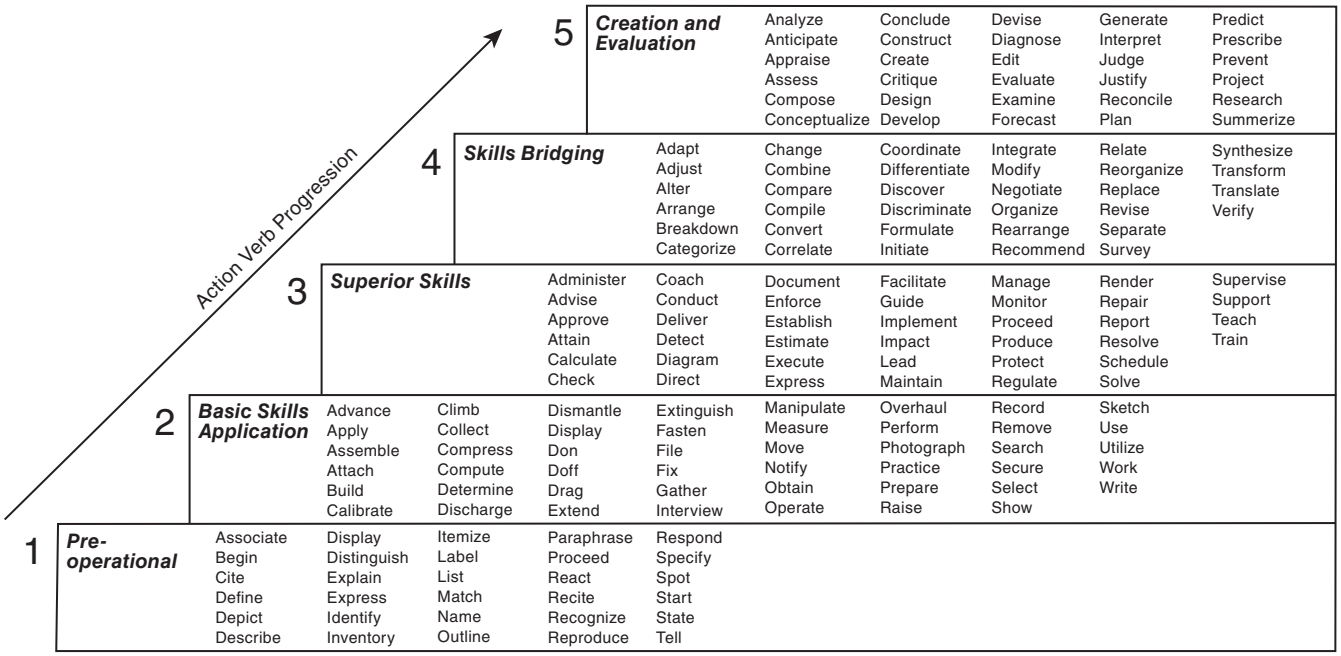

FIGURE B.2.1 Examples of Action Verbs.