National Fire Academy

N0492 – Emergency Resource Deployment Planning (SOC)
Version: 1st Edition, 8th Printing, October 2022
Quarter:
ACE Credit: In the upper division baccalaureate degree category, three semester hours in fire science, emergency management, information technology, data analytics, or public safety.
IACET Continuing Education Units: 4.0

Length of Course: 6 Days (40 hr., 20 min. contact hours, Sunday – Friday)
Prerequisite: Yes
Curriculum: Planning and Information Management
Training Specialist: Dave Donohue
Instructor:
Instructor email/phone:
Classroom: J-
Meeting Time: 8 AM – 5 PM

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Course Description (Catalog)

R0492 – "Emergency Resource Deployment Planning (SOC)." This course is designed for fire/EMS service leaders and managers, local officials and planning personnel who are faced with performance outcome management decisions that relate to providing fire protection and EMS for their community. Rapid change in the demand for fire and emergency services and the lack of commensurate funding and resources impacts service delivery and risk to both providers and citizens. Students collect data, analyze, compare and contrast findings to identifying base-level performance standards and changes influenced by internal and external

impacts. Metrics are used to demonstrate changes in current and future service levels; expenditures and resource allocations; and changing impacting risk impacts on citizens and the community. Until recently, being able to quantify and justify increases in fire-related services has been difficult because of a lack of available data and accepted analytic methods. This course will demonstrate how national fire incident data and analysis tools combined with the IAFC/International City/County Management Association "Standards of Coverage" and Insurance Services Office methodology can document the distribution and concentration of fixed and mobile resources and develop an acceptable model to meet community performance and outcome standards and to guide future growth discussions. This six-day course is "hands-on" and requires participating agencies to provide local fire and emergency service resource data and an inventory of values at risk (critical infrastructure/target hazard information, etc.). Specific requirements will be provided in the pre-course information.

Student Qualifications (Primary and Secondary Audience)

The target audience for this course consists of fire and emergency service personnel in positions of authority who have an opportunity to exercise leadership. The students must, minimally, be assigned to a supervisory level position, e.g., company officer.

Course Scope (Goal)

The goal of this course is for students to develop a comprehensive SOC for their fire organization.

Course Objectives (Course Learning Outcomes – TLOs)

After successfully completing this course, you will be able to accomplish the following:

- Prepare themselves for training after reviewing administrative matters and making introductions.
- Identify and analyze stakeholder expectations, Standards of Coverage components, and risk assessment factors required for system performance improvement.
- Conduct a task analysis, incorporating elements of risk assessment, including NFIRS data, and geographic information system (GIS) software programs.
- Compare the properties of data types.
- Compile and develop the quantitative components needed for a Standards of Cover (SOC).
- Compile and develop the predictive components needed for an SOC.
- Select, use and apply data analysis tools and techniques appropriate to the creation of risk assessment, deployment analysis and performance measurement.
- Use National Fire Incident Reporting System (NFIRS) and common data analysis tools to evaluate an organization's abilities to mitigate and respond to risk (Plan, Mitigate, Respond and Recover).

- Learn how to use the United States National Grid (USNG) to read and plot coordinates on a map.
- Select, use and apply data analysis tools and techniques appropriate to the creation of risk assessment, deployment analysis and performance measurement.
- Use National Fire Incident Reporting System (NFIRS) and common data analysis tools to evaluate an organization's abilities to mitigate and respond to risk (Plan, Mitigate, Respond and Recover).
- Given GIS and SOC data, you shall propose Standards of Coverage criteria for application in your jurisdiction.

Course Delivery Method

The National Fire Academy (NFA) offers specialized training courses and advanced management programs of national impact in an academic classroom environment on campus at the National Emergency Training Center (NETC) in Emmitsburg, Maryland and through their State, local, tribal, and US territories training partners. All course materials are designed for interactive classroom environments, in either paper notebook or electronic formats.

Course Schedule

The purpose of the course schedule is to give you, at a glance, the required preparation, activities, and evaluation components of your course.

DAY 1	DAY 2
Unit 0: Welcome	Unit 2: Data Analysis and Techniques (cont'd)
Break	*Break*
Unit 0: Welcome (cont'd)	Unit 2: Data Analysis and Techniques (cont'd)
Break	*Break*
Unit 1: Expectations, Standards of Cover, Performance Measures and Risks	Unit 2: Data Analysis and Techniques (cont'd)
Lunch Break	*Lunch Break*
Unit 1: Expectations, Standards of Cover, Performance Measures and Risks (cont'd)	Unit 2: Data Analysis and Techniques (cont'd)
Break	*Break*
Unit 2: Data Analysis and Techniques	Unit 2: Data Analysis and Techniques (cont'd) Unit 3: Working With Statistics

Evening Icebreaker Activity

DAY 3	DAY 4
Unit 3: Working With Statistics (cont'd)	Unit 3: Working With Statistics (cont'd)
Break	*Break*
Unit 3: Working With Statistics (cont'd)	Unit 4: Geographic Information Technologies
Break	*Break*
Unit 3: Working With Statistics (cont'd)	Unit 4: Geographic Information Technologies (cont'd)
Lunch Break	*Lunch Break*
Unit 3: Working With Statistics (cont'd)	Unit 4: Geographic Information Technologies (cont'd)
Break	*Break*
Unit 3: Working With Statistics (cont'd)	Unit 4: Geographic Information Technologies (cont'd)

DAY 5	DAY 6
Unit 4: Geographic Information Technologies (cont'd)	Unit 5: Bringing It Full Circle
Break	*Break*
Unit 4: Geographic Information Technologies (cont'd)	Unit 5: Bringing It Full Circle (cont'd)
Break	*Break*
Unit 4: Geographic Information Technologies (cont'd)	Unit 5: Bringing It Full Circle (cont'd)
Lunch Break	*Lunch Break*
Unit 4: Geographic Information Technologies (cont'd)	Unit 5: Bringing It Full Circle (cont'd)
Break	*Break*
Unit 4: Geographic Information Technologies (cont'd)	Unit 5: Bringing It Full Circle (cont'd)

Course Resources (Instructional Materials)

In order to be fully prepared, obtain a copy of the required textbooks and other instructional materials prior to the first day of class.

Required Readings

The student must complete required readings during the course to be able to thoughtfully participate in discussions and activities.

None.

Suggested Reading/Resources

Suggested readings and resources are not evaluated, but may enhance the student's understanding, serve as additional sources for citation and promote discussion of course material.

None.

Required Resources (Course Textbook)

Student Manual.

Supplemental Resources (Supplemental Course Textbook)

None.

Grading Methodology (Evaluation Procedures)

A minimum final grade of at least 70 percent is required to pass this course.

Numerical Score	Letter Grade
100-90	A
89-80	B
79-70	C
69 or below	F

Students will be given exams at the end of the class, and only the instructor will grade the exams. While the exams are being graded by the instructor, students will be asked to complete end-of-course evaluations.

Exams are to be completed individually and not as a group or a group activity, unless specifically directed within the instructor guide for the specific course. Students should use pencils to complete answer sheets if bubble sheets and a scoring key overlay are being used.

There should only be one answer for any given question marked by the student. A question with multiple answers is considered incorrect. Please mark number of incorrect answers on completed exam sheets, record score (percentage), and mark the appropriate letter grade.

Transfer the letter grades to the corresponding student name on the course roster.

If a student does not obtain a passing grade on the first attempt, the instructor will provide remediation[1] prior to a retest. Students who do no pass the first exam will be allowed to take one retest of a new exam before departing from the class. A second failure will result in a grade of "F" being recorded on the grade roster.

Once all exams have been graded, instructors should review the exam as a group.

In the event of unusual events (storm, fire response, family emergency) or early departure, the host agency or state representative may be asked to proctor the exam at a later date. The instructor is responsible to notify the Training Specialist as soon as practical of the situation and name of person responsible for the exams and testing process.

Required Reading Assignments

Student completion of reading assignments will be done via evaluation of their class participation and will not be a separately graded activity.

Suggested Readings

Suggested readings are not evaluated, but may enhance the student's understanding and promote discussion of course material.

Course Outline

Unit 0: Welcome (Day 1)

Objectives

<u>**Terminal Objective**</u>

The students will be able to:

0.1   Prepare themselves for training after reviewing administrative matters and making introductions.

<u>**Enabling Objective**</u>

The students will be able to:

0.1   Introduce themselves and list personal expectations for the course.

Unit 1: Expectations, Standards of Cover, Performance Measures and Risk (Day 1)

Objectives

<u>**Terminal Objective**</u>

The students will be able to:

1.1   At the conclusion of the unit of instruction analyze stakeholder expectations, Standards of Cover (SOC) components and risk assessment factors required for system performance improvement.

<u>**Enabling Objectives**</u>

The students will be able to:

1.1   Define SOC and its components.

1.2   Critique the component advantages of an SOC.

1.3   Describe core performance measures used in an SOC.

1.4   Apply study data/results for use in an SOC.

1.5   Discuss the elements of a community profile, including key stakeholders, demographics, and community specific elements, which may impact SOC.

1.6   Determine your community's expected level of service.

1.7   Appraise deployment of resources and compare emergency versus nonemergency deployments.

1.8   Interpret, document and incorporate community expectations in terms of performance and outcome measures for inclusion in an SOC.

1.9   Compare performance measures and how they are used.

1.10   Explain the elements that must be included in developing a service-level objective.

1.11   Discuss risk and its components.

1.12   Explain risk assessment methodologies.

1.13   Employ data to prepare for use in a risk assessment for an SOC.

1.14   Discuss community risks and hazards as they relate to emergency services.

1.15   Explain the concept of strategic planning and how it relates to risk analysis.

Unit 2: Data Analysis and Techniques (Day 1)

Objectives

Terminal Objective

The students will be able to:

2.1   At the conclusion of the unit of instruction, create a task analysis, incorporating elements of risk assessment, including National Fire Incident Reporting System (NFIRS) data, and geographic information system (GIS) software programs.

Enabling Objectives

The students will be able to:

2.1   Discuss deployment analysis methodology.

2.2   Create a deployment analysis.

2.3   Examine a critical task analysis methodology.

2.4   Create a critical task analysis.

2.5   Support NFIRS data and how they are used in risk assessment.

Unit 3: Working with Statistics (Day 3)

Objectives

<u>Terminal Objectives</u>

The students will be able to:

3.1   Compare the properties of data types.

3.2   Assemble the quantitative components needed for a Standards of Cover (SOC).

3.3   Assemble the predictive components needed for an SOC.

<u>Enabling Objectives</u>

The students will be able to:

3.1   Explain the properties of data types.

3.2   Differentiate between data types.

3.3   Determine the purpose of descriptive statistics in SOC analysis.

3.4   Calculate descriptive statistics.

3.5   Apply manipulation and summarization techniques to calculate deviations of data.

3.6   Prepare extracted data.

3.7   Modify data parameters.

3.8   Explain the ethical use of data.

3.9   Explain the purpose of predictive statistics and demonstrate their use.

3.10   Calculate coefficients of correlation.

3.11   Explain use of correlation tools.

3.12   Demonstrate the application of discrete application models.

3.13   Apply interpolative method.

3.14   Demonstrate appropriate survey instrument construction skills.

3.15   Demonstrate assigning relative values — Size, Height, Use, and Probability (SHUP) and Risk, Hazard and Value Evaluation (RHAVE).

3.16   Given a scenario, accurately estimate the probability of occurrence within acceptable standard of deviation.

3.17   Test the use of risk analysis programs for application within their organization.

Unit 4A: Geographic Information Technologies (Day 4)

Objectives

Terminal Objectives

The students will be able to:

4A.1   Assemble a risk assessment, deployment analysis and performance measurement to support a Standard of Cover (SOC) assessment.

4A.2   Given National Fire Incident Reporting System (NFIRS) and data analysis software, evaluate an organization's abilities to mitigate and respond to risk (Plan, Mitigate, Respond and Recover).

4A.3   Integrate the United States National Grid (USNG) System with a given maps coordinate and landmark system.

Enabling Objectives

The students will be able to:

4A.1   Articulate the characteristics of a geographic information system (GIS), Remote Sensing and GPS methods for application in conducting an SOC for a given jurisdiction.

4A.2   Explain basic analysis techniques.

4A.3   Convert GPS points for use in GIS.

4A.4   Translate NFIRS data for use in GIS.

4A.5   Given a feature on a scaled map product, determine the USNG coordinate.

4A.6   Given a USNG coordinate, distinguish the location of features on a scaled map product.

Unit 4B: Geographic Information Technologies (Day 5)

Objectives

<u>**Terminal Objectives**</u>

The students will be able to:

4B.1   Assemble a risk assessment, deployment analysis and performance measurement to support a Standard of Cover (SOC) assessment.

4B.2   Given National Fire Incident Reporting System (NFIRS) and data analysis software, evaluate an organization's abilities to mitigate and respond to risk (Plan, Mitigate, Respond and Recover).

<u>**Enabling Objectives**</u>

The students will be able to:

4B.1   Calculate attribute summary and geographic statistics.

4B.2   Create charts describing attribute data.

4B.3   Compare appropriate interpolation method.

4B.4   Apply the Poisson distribution to describe fire activity.

4B.5   Score risk levels based on map algebra.

4B.6   Express response times.

4B.7   Express service areas.

4B.8   Create integrative map products which support SOC.

4B.9   Demonstrate the integration of GIS layer information for a given jurisdiction and apply response SOC to evaluate the impact of information on response capabilities.

Unit 5: Bringing It Full Circle (Day 6)

Objective

Terminal Objective

The students will be able to:

5.1   Given GIS and SOC data, you shall propose Standards of Coverage criteria for application in your jurisdiction.

Enabling Objectives

The students will be able to:

5.1   Propose standards of coverage IAW accepted standard.

5.2   Determine the information that will need to be developed and applied as data into data to determine the appropriate standards of coverage.

5.3   Determine the NFA core values to be applied to a standards of coverage assessment.

5.4   Articulate one element of applicable knowledge to be applied to the standards of coverage.

5.5   Develop the required elements for a standards of coverage for first alarm assignment.

5.6   Predict the difference between jurisdictional standards of coverage and industry standards of coverage.

5.7   Develop methods for meeting the difference between jurisdictional standards of coverage and industry standards of coverage.

Policies

Class Attendance and Cancellation Policy

Attendance

- You are required to attend all sessions of the course. If you do not, you may not receive a certificate.

- If you need to depart the training facility early and miss any portion of the course, you must make the request in writing to the sponsoring agency (e.g., State training director, etc.). The State training director may waive the attendance requirement in order to accommodate you with extraordinary circumstances as long as you complete all course requirements.

Course Failure

You can reapply for the failed course or any other NFA course and go through the random selection process. You don't have to successfully complete the failed course before attending another NFA course.

Student Code of Conduct Policy

Students, instructors and staff are expected to treat each other with respect at all times. Inappropriate behavior will not be tolerated.

Writing Expectations

Student writing will conform to the generally accepted academic standards for college papers. Papers will reflect the original work of the student and give appropriate credit through citations for ideas belonging to other authors, publications or organizations. Student written work should be free of grammatical and syntax errors, free of profanity or obscene language or ideas, and reflect critical thinking related to the course subject matter.

Citation and Reference Style

Attention Please: Students will follow the APA, Sixth Edition as the sole citation and reference style used in written work submitted as part of coursework to NFA. Assignments completed in a narrative essay, composition format, abstract, and discussion posts must follow the citation style cited in the APA, Sixth Edition.

Late Assignments

All assignments must be turned in by the established deadline. Late submissions could result in a 10 percent decrease in grade.

Disclaimer Statement

Course content may vary from the outline to meet the needs of this particular group.

Grading

Please review the following rubrics that explain how grades will be awarded.

Students who do not complete the entire course will be awarded an Incomplete (I) grade. In accordance with National Fire Academy academic policies, an Incomplete (I) grade must be removed by the end of the next semester following the course, or it automatically becomes a Failing (F) grade.

https://www.usfa.fema.gov/training/nfa/admissions/student_policies.html

Academic Honesty

Students are expected to exhibit exemplary ethical behavior and conduct as part of the NFA community and society as a whole. Acts of academic dishonesty including cheating, plagiarism, deliberate falsification, and other unethical behaviors will not be tolerated.

Students are expected to report academic misconduct when they witness a violation. All cases of academic misconduct shall be reported by the instructor to the State training director or host agency and to the NFA Training Specialist.

If a student is found to have engaged in misconduct and the allegations are upheld, the penalties may include, but are not limited to one or a combination of the following:

- expulsion,
- exclusion from future classes for a specified period; depending on the severity it could range from 1-10 years, and/or
- forfeiture of certificate for course(s) enrolled in at NETC.

Refer to NFA-specific Standard Operating Procedure 700.1 – *Academic Code of Conduct and Ethics* for more information.

Grading Rubrics

	Precourse and Unit Activities	Estimated Time	Score Range			Individual Activity	Group Activity
1.	Complete the online self-study course Q0494	180 min	0/5	Copy of certificate	Due first day of class	0 = No document 5 = Document presented	
2.	GIS Tutorial 2 Book UMD Tutorial	120 min	0/4	Test basic concepts Produce maps or screen shots of Activities 1.3 and 2.4 from Tutorial 2	Due first day of class	0 = No materials for Activities 1.3 and 2.4 2 = One activity completed 4 = Both activities completed	
3.	Excel Basic Excel Advanced Captivate Tutorial	180 min	0/4	Test basic concepts Produce a Name Range List	Due first day of class	0 = No List product delivered 4 = List produced in proper format	
	Unit 1 Activity 1.1		0-1	Activity 1.1	Complete the worksheet by describing the seven components of an SOC and the purpose/relationship to an SOC	0 = Unable to identify the seven components 1 = Individual accurately identified the seven components of an SOC	0 = Table group unable to identify purpose and relationship of the component to the SOC 1 = Table group successfully identifies both the purpose and relationship of the seven components to the SOC

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Precourse and Unit Activities	Estimated Time	Score Range			Individual Activity	Group Activity
Unit 1 (cont' d) Activity 1.2		0-1	Activity 1.2	Students are to discuss the Core Performance Measures Service-Level Objectives, and then in the table group develop a statement that articulates the level of service that will be provided, given community expectations		0 = Table group unable to identify and relate Core Performance to community expectations 1 = A list of service-level objectives are described based on level of service and relational community expectations
Unit 1 (cont' d) Activity 1.3		0-1	Activity 1.3	Risk Assessment: Identify tools used in planning and how risk assessment tools can aid in planning		Small Group Activity 0 = Sources of information and examples of tools were not provided 1 = Examples of tools, i.e., inspection reports, fire incident data, site reports, etc., were provided with indication of how the validity of the data can influence your outcome

Precourse and Unit Activities	Estimated Time	Score Range			Individual Activity	Group Activity
Unit 2 Activity 2.1		0-2	Create a list of Critical Tasks for analysis and define tasks	Worksheet	0 = Unable to create list and/or define tasks 1 = Identified a minimum of three tasks with definitions 2 = Identified seven Critical Tasks and definitions	
Unit 2 (cont' d) Activity 2.2		0-2	Create a list of Critical Task Mapping Tasks and relate the tasks to objectives	Worksheet	0 = Unable to create list and/or relate to an objective 1 = Identified a minimum of three tasks with relationships to objectives 2 = Identified Critical Mapping Tasks and their objectives	
Unit 3 Activity 3.1		0-2	Activity 3.1	Basic Statistics	0 = Did not complete 1 = Inaccurate 2 = Correct answer	
Unit 3 (cont' d) Activity 3.2		0-2	Activity 3.2	Statistical Functions	0 = Did not complete 1 = Inaccurate 2 = Correct answer	

Precourse and Unit Activities	Estimated Time	Score Range			Individual Activity	Group Activity
Unit 3 (cont' d) Activity 3.3		0-2	Activity 3.3	Analysis of Tables	0 = Did not complete 1 = Inaccurate 2 = Correct answer	
Unit 3 (cont' d) Activity 3.5		0-2	Activity 3.5	Correlation	0 = Did not complete 1 = Inaccurate 2 = Correct answer	
Unit 3 (cont' d) Activity 3.7		0-2	Activity 3.7	Risk Calculators Comparison Tools	0 = Did not complete 1 = Inaccurate 2 = Correct answer	
Unit 4 Activity 4.1		0-10	Activity 4.1	Complete the Water Flow Capacity and First Due Assignments Worksheet	0 = Worksheet not completed 5 = Inaccuracies in designation of flow and or first due 10 = Complete and accurate documentation	

Precourse and Unit Activities	Estimated Time	Score Range			Individual Activity	Group Activity
Unit 4 (cont' d) Activity 4.2		0-10	Activity 4.2	Complete the Data Integration Worksheet, produce a 100 x 100 meter USNG polygon, with normalized attributes, to create a model for evaluating SOC, indicating the flow and the color of the hydrants to be painted	0 = Worksheet not completed 5 = Inaccuracies in production of the 100 x 100 meter polygon or attributes 10 = Complete and accurate model for evaluating SOC, including flow and hydrant colors	
Unit 5 Activity 5.1		0-30	Activity 5.1 Final Presentation	SOC Presentation Outline with PowerPoint. Utilizing the Presentation Template, apply and discuss the information that would be obtained from an in-depth analysis of the seven components of an SOC	0-10 points Individual will develop one or more of the elements based on the template and seven components of the SOC receive contribution to the outline of an SOC Planning Document	0-20 points Group Presentation The combined effort of the group will be based on the documentation and articulation of the development of the in-depth analysis and the approach to the possible implementation strategy required for an SOC
Unit 5 (cont' d) Activity 5.2		0-20	Activity 5.2 Deployment Analysis and Fire Flow Requirements		Students will complete the Deployment Activity and identify the fire flow requirements	