

Exercise Design and Evaluation

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Agenda

- Aim
- Introduction
- Phases
- Building Block Approach
- Design and Development
- Questions and Discussion

Aim

- **Introduce principles of exercise design and evaluation**
- **Provide an awareness of some of the challenges and benefits**

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Introduction

- **Emergency Management Exercises**
- **Multi-Year Exercise Program**
- **Exercise Program Governance**

Emergency Management Exercises

- What is an exercise?

Emergency Management Exercises (Cont'd)

- What is an exercise?

An exercise is a simulated emergency, in which members of various agencies perform the tasks that would be expected of them in a real emergency.

Emergency Management Exercises (Cont'd)

- Why are exercises so important?

Emergency Management Exercises (Cont'd)

- **Why are exercises so important?**
 - Essential component of an emergency management program
- **Three main functions:**
- **Validation**
 - To validate plans, protocols, and procedures and demonstrate resolve to prepare for emergencies.
- **Training**
 - To develop staff competencies, to give staff practice in carrying out their roles in the plans, and to assess and improve performance.
- **Testing**
 - To test well-established procedures and reveal gaps that may exist.

Emergency Management Exercises (Cont'd)

- What is an Exercise Program?

Emergency Management Exercises (Cont'd)

- **What is an Exercise Program?**
- It's a risk-based process that includes a cycle, mix, and range of exercise activities of varying degrees of complexity and interaction.

Multi-Year Exercise Program (Cont'd)

Exercise Matrix					
	Workshop = W	Drill = D	Tabletop = TTX	Functional = FL	Full Scale = FS
Need	1 st Year	2 nd year	3 rd year	4 th Year	5 th Year
New Hazard	W	TTX	D	FL	FS
New EOC	W				
Breakdown of Alert/Notification	W/D	W/D	W/D	FL	FS
Change in Emergency Plan	W	W	W	FL	FS
Lack of training for damage assessment	W/D	W/D	W/D	FL	FS

Multi-Year Exercise Program (Cont'd)

Example: Multi-Year Exercise Program Strategic Plan						
Organization: _____						
Workshop = W	Drill = D	Tabletop = TT	Functional = FL	Full-scale = FS		
Functions	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year	
Alert, Notification, Warning						
Coordination						
Communications						
Damage assessment						
Individual/family assessment						
Resource management						
Financial management						
Emergency transportation						
Info & planning						
HazMat						
Logistics						
Evacuation						
Mass care						
Emergency Social Services						
Emergency Public Information						
Health & medical						
Fire fighting						
Search & Rescue						

Exercise Program Governance

- What is Governance?

Exercise Program Governance (Cont'd)

- **What is Governance?**

It refers to how an exercise program is run and controlled. It sets the processes that define expectations, verify performance, and is a mechanism to provide accountability.

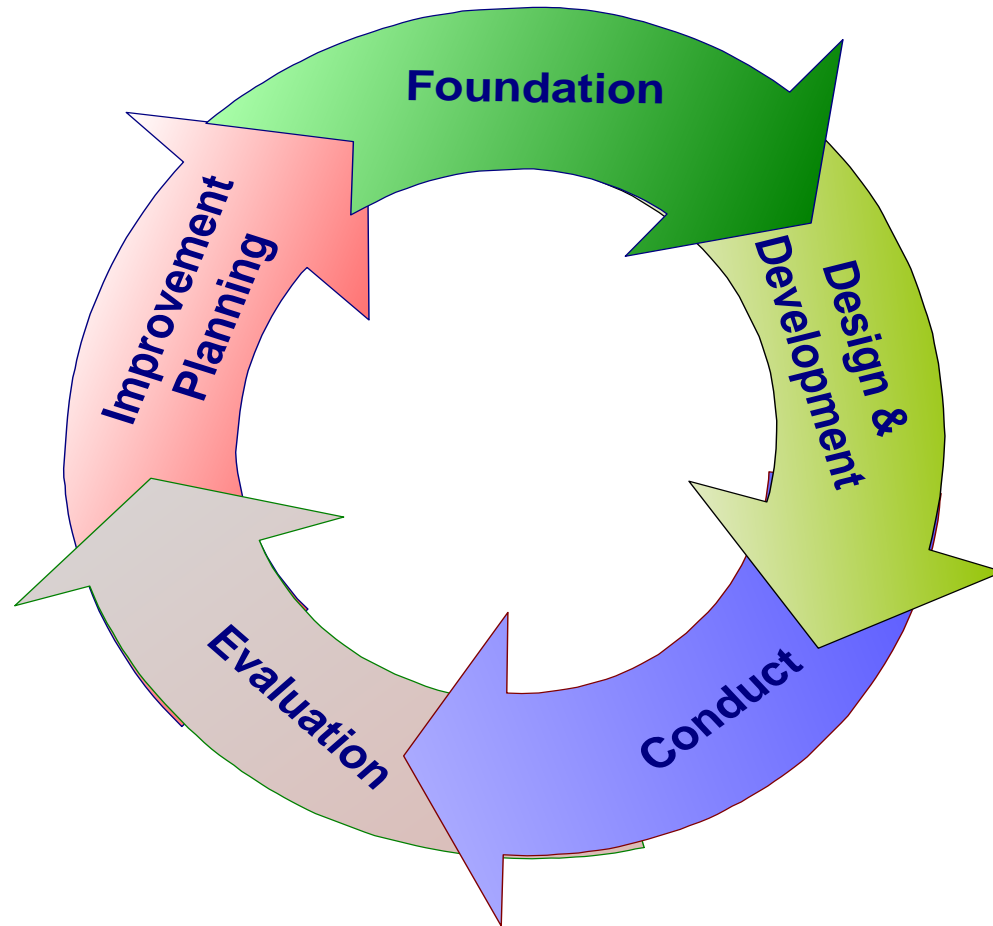
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Five Phases of an Exercise

- **Phase 1** **Prepare the Foundation**
- **Phase 2** **Design and Develop the Exercise**
- **Phase 3** **Conduct the Exercise**
- **Phase 4** **Evaluate and Report on the Exercise**
- **Phase 5** **Improvement Planning**

Five Phases of an Exercise



Phase 1 Prepare the Foundation

What is the Foundation?

Phase 1 Prepare the Foundation

What is the Foundation?

This stage focuses on developing a timeline, establishing milestones, identifying an *exercise planning team*, and scheduling planning conferences.

Phase 1 Prepare the Foundation

What is the Foundation?

This is the first stage in the exercise stage, focusing on developing a project management timeline, establishing milestones, identifying an *exercise planning team*, and scheduling planning conferences.

What is an Exercise Planning Team?

Phase 1 Prepare the Foundation

What is the Foundation?

This is the first stage in the exercise stage, focusing on developing a project management timeline, establishing milestones, identifying an *exercise planning team*, and scheduling planning conferences.

What is an Exercise Planning Team?

This is a group of individuals with the overall responsibility for all phases of an exercise.

Phase 2 Design and Develop the Exercise

- What is Design and Development?

Phase 2 Design and Develop the Exercise

- What is Design and Development?

Building on the exercise *foundation*, the design and development process consists of identifying *capabilities*, *tasks*, and *objectives*, designing the *scenario*, creating documentation, coordinating logistics, planning exercise conduct, and selecting an evaluation and improvement methodology.

Phase 2 Design and Develop the Exercise

- What are Exercise Objectives?

Phase 2 Design and Develop the Exercise

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These are established for every exercise. Well-defined objectives provide a framework for *scenario* development, guide individual organizations' objective development, and inform exercise *evaluation* criteria.

Phase 2 Design and Develop the Exercise

- **What are Exercise Objectives?**

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- **What is an Exercise Scenario?**

Phase 2 Design and Develop the Exercise

- **What are Exercise Objectives?**

These are established for every exercise. Well-defined objectives provide a framework for *scenario* development, guide individual organizations' objective development, and inform exercise *evaluation* criteria.

- **What is an Exercise Scenario?**

It provides the backdrop and storyline that drive an exercise. For *discussion-based* exercises, a scenario provides the backdrop that drives *participant* discussion. For *operations-based* exercises, the scenario provides background information on the incident catalyst of the exercise.

Phase 3 Conduct the Exercise

- **Conducting a successful exercise requires:**
 - facilitation skills
 - project management skills
- **includes the following steps:**
 - Setup
 - Briefings
 - Facilitation
 - Control
 - Evaluation
 - Wrap up activities

Phase 4 Evaluate and Report on the Exercise

What is Exercise Evaluation?

Phase 4 Evaluate and Report on the Exercise

What is Exercise Evaluation?

It's the act of observing and recording exercise activity or conduct, by comparing the behavior or actions against the exercise objectives, while noting strengths and weaknesses.

Phase 4 Evaluate and Report on the Exercise



Evaluation Process

- **All the steps from the evaluation phase lead to the improvement planning phase.**
 - Step 1: Plan and organize the evaluation
 - Step 2: Observe the exercise and collect data
 - Step 3: Analyze data
 - Step 4: Develop the draft After Action Report
 - Step 5: Conduct an exercise debrief
 - Step 6: Identify improvements and corrective actions that need to be implemented
 - Step 7: Finalize and issue the After Action Report
 - Step 8: Track implementation

Phase 5 Improvement Planning

- **Successful follow-up to an exercise requires analytical and practical skills in order to turn the lessons learned from an exercise into concrete, measurable steps that result in improved capabilities. Successful follow-up activities include the following steps:**
 - Corrective Action Plan
 - Improvement Plan

Phase 5 Improvement Planning

- **Any exercise program functions in a cyclical way:**
 - a foundation and a plan
 - moves into the design and development stage
 - moves on to exercise execution and then
 - completes a full cycle with an evaluation
 - then goes into the corrective action and improvement planning stages.

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Building Block Approach

- **What is a Building Block Approach?**

Building Block Approach

- **What is a Building Block Approach?**

There is a focus on exposing participants to a cycle of training and exercises that escalates in complexity, with each exercise designed to build upon the last, in terms of scale and subject matter. For example, a building-block series of exercises may include a *seminar*, which leads to a *tabletop exercise (TTX)*, which leads to a *full-scale exercise (FSE)*.

- **Discussion –Based Exercises**
- **Operations-Based Exercises**

Discussion-Based Exercises

Discussion-based exercises	Operations-based exercises
Seminars	Drills
Workshops	Functional Exercise
Tabletop Exercises	Full Scale Exercise
Games	

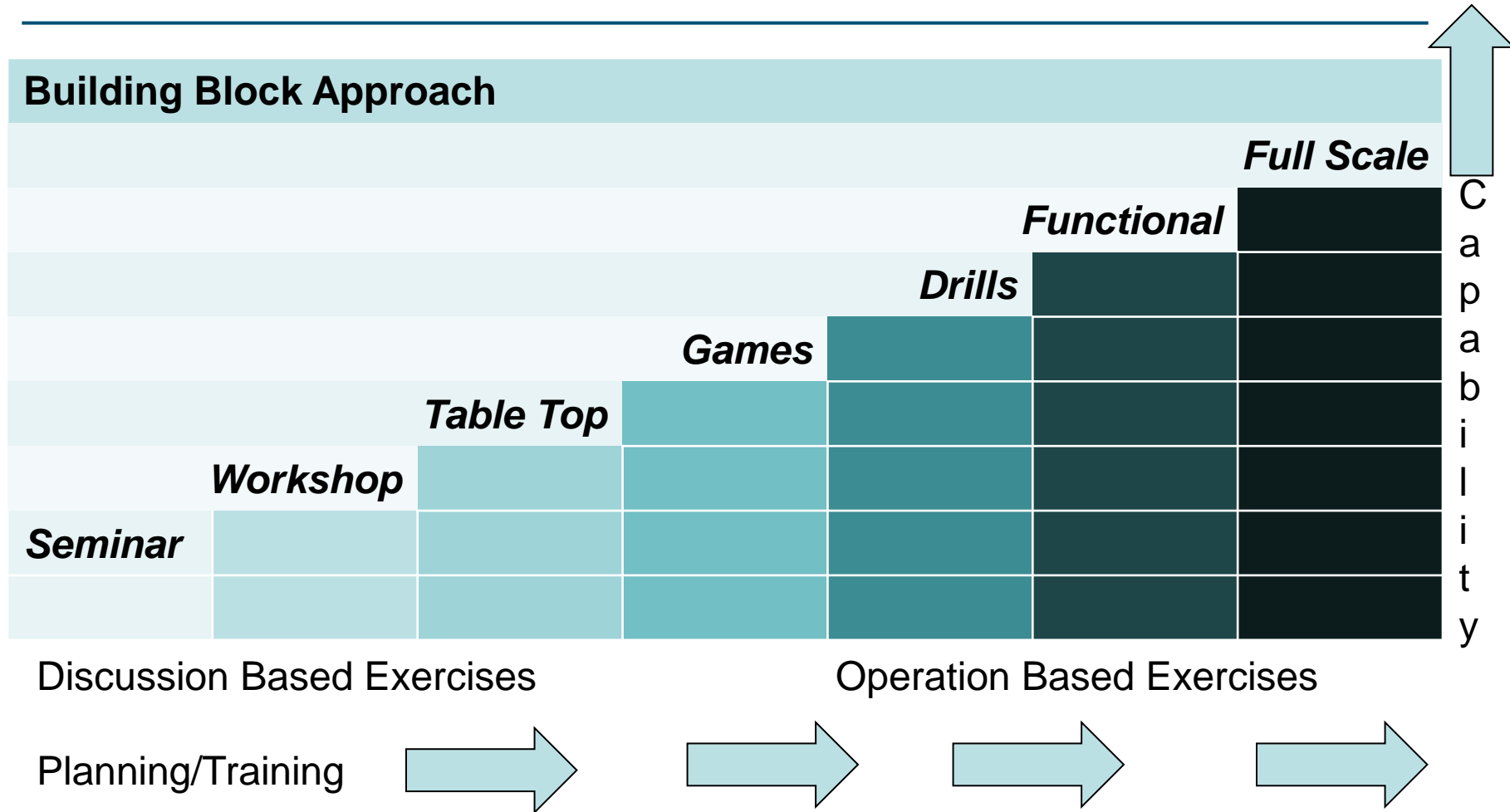
Building Block Approach

Reasons To Conduct Exercises

Seminars and Workshops	Drills	Tabletop Exercises and Games	Functional, Full Scale & Live Exercises
No previous exercises	Assess equipment capabilities	Practice group problem solving	Assess and improve information analysis
No recent major Emergencies	Test response time	Promote familiarity with your Emergency Plan	Assess & improve interagency coordination and cooperation
New Plan	Personnel training	Assess plan coverage for a specific risk	Support policy formulation
New Procedures	Assess interagency cooperation	Assess interagency & interdepartmental coordination	Test resource and personnel allocation
New Staff, Leadership	Verify staff and resource capabilities	Observe information sharing	Assess personnel and equipment
New Facility, Risk or Threat		Test group message interpretation	Assess Media Management
New mutual aid agreement		Test familiarity with roles in plan	
Specific case study		Improve agency contacts	
Executive familiarity			

Note: Any category to the right includes all components of those to the left.

Building Block Approach



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Design and Development

- **Eight Steps of Exercise Design**
- **Exercise Documentation**

Eight Steps of Exercise Design

Step 1	Assess needs.
Step 2	Define the scope.
Step 3	Write a statement of purpose.
Step 4	Define objectives.
Step 5	Compose a narrative.
Step 6	Write major and detailed events.
Step 7	List expected actions.
Step 8	Prepare messages.

Step 1 - Assess Needs

- What is a Needs Assessment?

Step 1 - Assess Needs

- **What is a Needs Assessment?**

It's is a process of defining an organization's inventory of problems or needs.

- **Has three basic steps**

- Define problems.
- Establish the reasons to do an exercise.
- Identify the functions to be exercised.

Step 2 - Define the Scope

- **“Defining the scope” means to put realistic limits on the areas addressed in the needs assessment.**
 - Scope needs to be clear and defined
- **Not all hazards can be tested**
- **Not all exercise types used**
- **Not all resources will be available**

Five Categories

- **Hazards**—normally, one main hazard is identified in the scenario of the exercise, even though others may develop.
- **Geographic area**—a defined location of the event is identified, such as an address, or specific site.
- **Functions**— identify what emergency management functions will be tested, based on need.
- **Organizations and personnel**—identify what organizations will be involved, and at what staffing levels.
- **Exercise type**— identify what type of exercise is needed or authorized.

Step 3 - Write a Statement of Purpose

- **Is a general statement about an upcoming exercise activity.**
- **Communicates to all interested parties**
 - the plan to exercise
 - the purpose of the exercise; and
 - the exercise scope

Example Statement of Purpose

- **The purpose of the proposed emergency management exercise is to improve the following emergency operations:**
 - Flood stage monitoring
 - Evacuation warning
 - Relocation of school children and senior citizen home
 - Reception centre management
- **by involving the following agencies and personnel:**
 - EMO, Fire Department, Public Works, Health Department, Red Cross and Salvation Army, Area Schools and Senior Citizen Homes in the area
- **in a *functional* exercise simulating a *flood caused by riverbank overflowing* at Queensway Bridge to Hwy 7 on June 20.**

Step 4 - Define Objectives

- **Good objectives need to use action words or verbs**
- **Be SMART**
 - Simple;
 - Measurable;
 - Achievable;
 - Realistic; and
 - Task oriented.

Step 4 - Define Objectives

- **Good Examples of Objectives**

- At the time the evacuation notice is received, the EOC policy and coordination groups will examine the needs of schools and other special facilities, and organize notification according to standard operating procedures.
- The EOC will identify and activate an alternate communication system within 30 minutes of the primary communication failure, as described in the emergency management plan.

- **Bad Examples of Objectives**

- To test the volunteer organizations.
- To get agencies to improve their disaster operations.

Step 5 - Compose a Narrative

- **Sample Scenario Narrative: Air Crash**
 - A Boeing 777, en route from Tokyo to Ottawa, is experiencing in-flight engine problems and will have to make an emergency landing. Plans have been made to land at Edmonton Airport.
 - However, the latest communications with the pilot indicates that the plane has lost engine power and is losing altitude too quickly to reach the airport in Edmonton. Instead, the plane will attempt to land at YOUR airport.
 - Conditions at your airport are clear, and the surrounding area is dry. Winds are from the north, steady, at 25 km per hour. The main runway lies along a relatively unpopulated suburban area, but it is not designed for a 777. Therefore, there is concern as to how successful the pilot will be in landing the plane. The approach will pass over populated housing developments.
 - The airport control tower has alerted the airport's Crash/Fire Rescue units and is requesting local emergency services to provide backup assistance in fire, medical, police, search and rescue, and welfare.
 - It's now 9 a.m. (The exercise begins.)

Step 6 - Write Major and Detailed Events

- Major events are problems that are likely to occur based on past events

Step 7 - List Expected actions

- **These are the desired actions or decisions the players are expected to make. For each major or detailed event, exercise coordinators and planners anticipate that the players will perform actions that follow the emergency management plan, including Standard Operating Procedures and other applicable procedures.**

Step 7 - List Expected actions (Cont'd)

- **Expected actions include:**
- **Verify (information gathering)**
- **Consider (discuss, negotiate, consult)**
- **Defer (put action on priority list)**
- **Decisions (deploy or deny resources)**

Step 7 - List Expected actions (Cont'd)

- ***Function being exercised:*** Coordination and communication among the airport and the jurisdiction's emergency systems.
- ***Objective:*** Upon notification that a crash is imminent, response units will stage within 3 minutes, according to SOPs.

Step 7 - List Expected actions (Cont'd)

- ***Expected Actions:***
- **Airport Control Tower:**
 - Notify local police agency, fire, ambulance, medical personnel to proceed to airport.
 - Alert hospitals of potential mass casualty incident.
- **Dispatch Centre:**
 - Alert police, fire, and medical supervisors.
- **Hospital:**
 - Notify other medical facilities as appropriate.
- **Crash/Fire Rescue:**
 - Initiate incident management system.
 - Notify dispatch of command post and staging locations.

Step 7 - List Expected actions (Cont'd)

- **Additional detail from the events above:**
- **Survivors entangled in wreckage**
 - expected action: special extrication equipment brought in.
- **Trapped people found severely injured**
 - expected action: paramedics establish emergency medical services branch within the incident management system structure being used.
- **Onlookers get in the way**
 - expected action: law enforcement sets up perimeter and security.

Step 8 – Prepare Messages

- **Messages are the means by which the expected actions are brought about.**
- **They are communicated to the players by:**
 - Telephone
 - Email
 - Radio
 - Delivered by hand
 - Whispered
 - Transmitted by fax

Exercise Documentation

- **Situation Manual**
- **Exercise Plan**
- **Player Handbook**
- **Exercise Control Plan**
- **Controller and Evaluator Handbook**
- **Master Events List**
- **Exercise Evaluation Guides**
- **Exercise Evaluation Plan**
- **Final Exercise Report**

Exercise Documentation

- What is a Situation Manual?

Exercise Documentation

- **What is a Situation Manual?**

It's a handbook provided to all *participants* in *discussion-based* exercises, particularly *TTXs*. It provides background information on the exercise *scope*, schedule, and *objectives*. It also presents the *scenario* narrative that will drive participant discussions during the exercise.

Exercise Documentation

- What is an Exercise Plan?

Exercise Documentation

- **What is an Exercise Plan?**

This is a general information document that helps *operations-based* exercises run smoothly. It is published and distributed prior to the start of exercise and provides a synopsis of the exercise.

Exercise Documentation

- **What's included in an Exercise Plan?**
 - Purpose of the exercise
 - General objectives
 - Overall exercise strategy
 - Exercise Planning Group structure
 - Agencies involved - tasks and responsibilities
 - Safety and security (in general terms)
 - Exercise type and basic information
 - Basic administrative and/or logistical support

Exercise Documentation

- What is a Player Handbook?

Exercise Documentation

- What is a Player Handbook?

A Player Handbook **contains a list of instructions for players, as well as information about player responsibilities and functions to be performed during the exercise.**

Exercise Documentation

- **What's In a Player Handbook?**

- A Schedule of player exercise briefings
- Provisions to review emergency management plans, policies, procedures
- Scenario overview
- A list of exercise objectives
- Procedures for preparation of exercise generated messages, logs and reports
- Emergency Operating Centre procedures
- Expected player actions
- Administrative requirements
- Recommended pre-exercise training events

Exercise Documentation

- What is an Exercise Control Plan?

Exercise Documentation

- **What is an Exercise Control Plan?**

This plan provides exercise controllers and simulators with guidance concerning procedures and responsibilities for exercise control, simulation, and support. It explains the exercise concept as it relates to controllers and simulators, establishes the basis for control and simulation of the exercise, and establishes and defines the communications, logistics, and administration structure needed to support control and simulation during the exercise.

Exercise Documentation

- **What's In an Exercise Control Plan?**
 - General objectives
 - Concept of play (exercise scope, scenario narrative, location of players)
 - Specific functional objectives
 - Procedures, responsibilities, assignments and support
 - Exercise Planning Group structure
 - Exercise timelines (including pre- and post exercise activities)
 - Emergency call-off procedures, safety and security
 - Artificialities, assumptions and simulations
 - Master scenario events list (MSEL) for the exercise
 - Communications capabilities, structure and procedures
 - Checklists or any other job aids needed (including maps, reference etc)

Exercise Documentation

- What is a Controller and Evaluator Handbook?

Exercise Documentation

- **What is a Controller and Evaluator Handbook?**

It's an exercise overview and instructional manual for *controllers* and *evaluators*. A supplement to the *Exercise Plan*, it contains more detailed information about the *scenario*, and describes controllers' and evaluators' roles and responsibilities. Because the C/E Handbook contains information on the scenario and exercise administration, it should be distributed only to those individuals specifically designated as controllers or evaluators.

Exercise Documentation

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Exercise Documentation

- What is a Master Events List?

Exercise Documentation

- **What is a Master Events List?**

It's a chronological timeline of expected actions and scripted events to be injected into exercise play by *controllers* to generate or prompt *player* activity. It ensures necessary events happen so that all *objectives* are met, and provides guidance for controllers and/or simulators in keeping the exercise on schedule.

Exercise Documentation

Sample Master Scenario Events List		
TIME	EVENT	EXPECTED ACTIONS
7:35 am	Plane radios tower: losing engine power and altitude	<ol style="list-style-type: none"> 1. Tower notifies dispatch centre. 2. Dispatcher alerts police, fire, medical services to proceed to airport.
7:40–7:50 am	Pilot reports major vibrations/noise. Requests runway designation.	<ol style="list-style-type: none"> 1. Tower designates runway; notifies dispatcher of runway and potential for mass casualty incident. 2. Dispatcher relays runway info to police, fire, medical. 3. Dispatcher notifies hospitals. 4. Crash/Fire Rescue initiates ICS; notifies Dispatcher of Crash Position and staging locations. 5. Dispatcher relays Crash Position and staging locations to police, fire, medical.
7:55 a.m.	Hospital calls dispatcher requesting more information	<ol style="list-style-type: none"> 1. Dispatcher gets potential number of casualties and relays info to hospital. 2. Hospital notifies other medical facilities.
8 a.m.	Media calls dispatcher requesting information	(etc.)

Exercise Documentation

- What are Exercise Evaluation Guides?

Exercise Documentation

- **What are Exercise Evaluation Guides?**

These documents support the exercise *evaluation* process by providing evaluators with consistent standards for observation, *analysis*, and *After Action Report* development.

Exercise Documentation

- What is an Exercise Evaluation Plan?

Exercise Documentation

- **What is an Exercise Evaluation Plan?**

It's typically used for *operations-based* exercises of a large *scope* and *scale*. This document provides specific guidance to exercise *evaluators*. It's designed to help exercise evaluators understand their roles and responsibilities in exercise data collection and evaluation in order to conduct an effective *analysis* of the exercise and produce a comprehensive *After Action Report/Improvement Plan*.

8 Steps in the Evaluation Process

- **Step 1: Plan and organize the evaluation**
- **Step 2: Observe the exercise and collect data**
- **Step 3: Analyze data**
- **Step 4: Conduct an exercise debrief**
- **Step 5: Develop the draft AAR**
- **Step 6: Identify improvements and corrective actions that need to be implemented**
- **Step 7: Finalize and issue the AAR**
- **Step 8: Track implementation**

Exercise Documentation

- **What's in an Evaluation Plan?**

- Purpose of the handbook
- General objectives
- Concept of play (scope, scenario narrative, location of players)
- Specific functional objectives
- Timelines (including pre- and post-exercise activities)
- Emergency call off procedures
- Artificialities, assumptions, and simulations
- Evaluation management & structure
- Evaluation team training
- Evaluation team responsibilities and procedures
- Evaluation reporting and documentation
- Administrative and logistical support
- Communications procedures and support

Exercise Documentation

- **Final Exercise Report**
 - should be compiled as soon as is practical after the debrief
 - should contain the goals, objectives and planned outcomes of the exercise
 - should contain an outline of the scenario and the planning process
 - should contain an evaluation section
- **used as a basis for the revision of plans and procedures, and in determining future training needs.**

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Questions and Discussion

