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Beyond Hurricanes Harvey & Irma….

A Crisis Information Management Framework For Regional Disaster Resiliency

September 13, 2017

Introduction

- **Framework Purpose** - Define a repeatable process for communities to measurably improve crisis information management capabilities
- **Document Audience** - Regional Constituencies, Program Managers, Planners, CIOs, Grant Makers, Audit Authorities
- **End-User Audience** - Public and private sector responders at local, regional, national, multinational levels
- **Delivery Model** - In-person diagnostic assessments, and online training and implementation toolkit (future)

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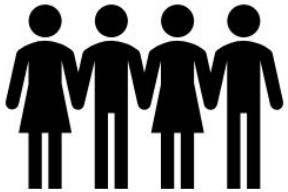
The Case for the Framework

Few resilience research efforts have focused on the development and application of solutions that measurably improve communities' ability to work together at a regional level, yet a majority of the most devastating and disruptive disasters are those that have had a regional impact.

Improving communities' posture to work together (i.e. systems interoperability)...is a primary means by which communities may improve regional disaster resilience.



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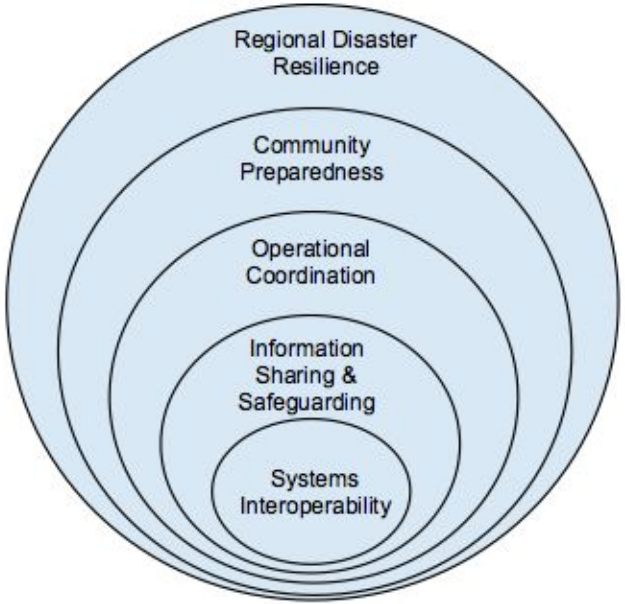
Defining the Framework

Figure 2: Linking Systems Interoperability to Disaster Resilience



A ⊇ B ⊇ C ⊇ D ⊇ E

Where $A \supseteq E$ means every element of E is also an element of A...

A = Regional Disaster Resilience

B = Community Preparedness

C = Operational Coordination

D = Information Sharing & Safeguarding

E = Systems Interoperability

"Thus, every element of systems interoperability is an element of disaster resilience, and arguably should become the **focal point for standardized measurement of communities' ability to work together**."

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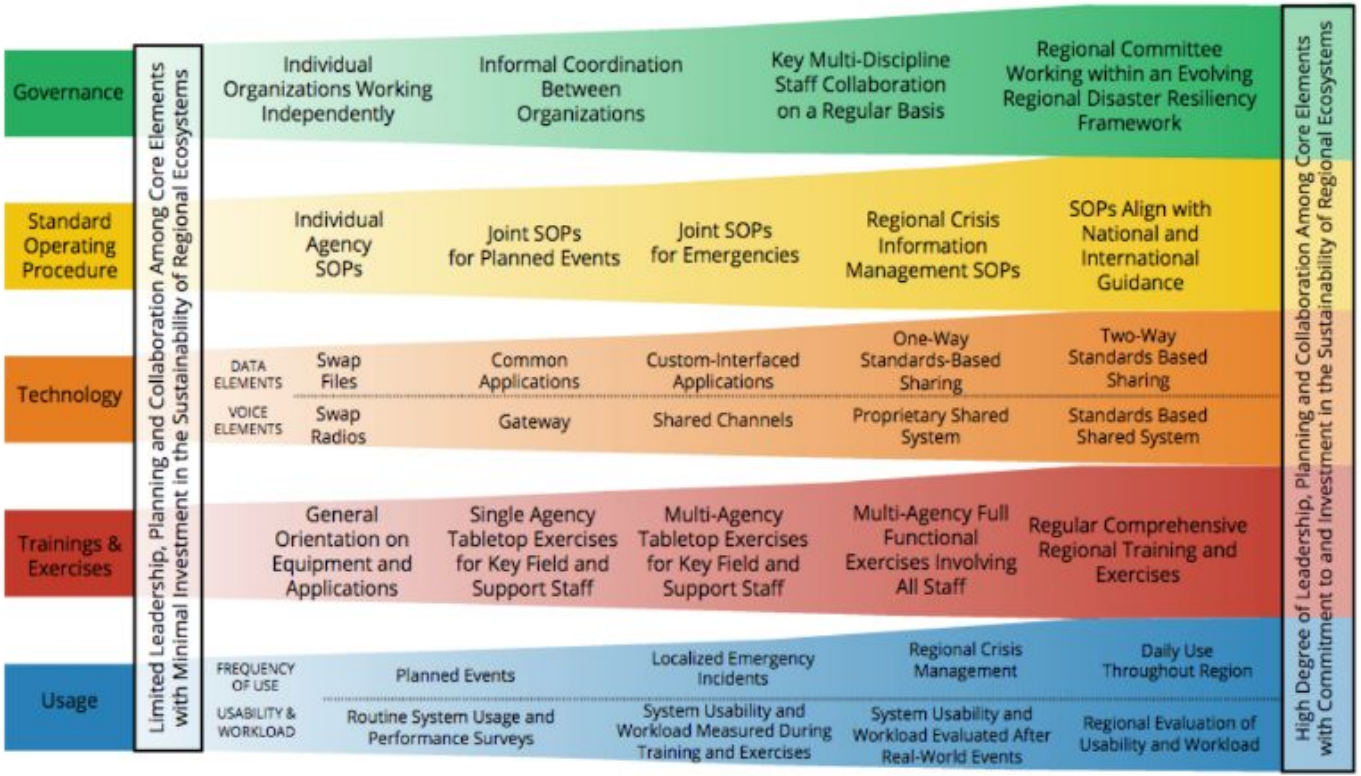
Defining Systems Interoperability



Systems interoperability is defined as the ability of human and technical systems to work together, without special effort...

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Policy Alignment

The framework helps communities tangibly and defensibly contribute to the achievement of national and international goals & priorities.

- **U.S. National Response Framework, Preparedness Goal**
  - Core Capabilities: Planning, Operational Coordination, Intelligence & Information Sharing, Community Resilience, Risk and Disaster Resilience Assessment.
- **Sendai Framework for Disaster Risk Reduction**
  - Priority 2: Strengthening disaster risk governance to manage disaster risk
  - Priority 4: Enhancing disaster preparedness for effective response…
- **National Emergency Management Association**
  - Recommended to Congress a renewed focus on programs that foster regional collaborations to support disaster resilience.

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The Framework Enables Organizations to:

- Implement a repeatable process for CIM improvement over a period of 2-5 years
- More explicitly link CIM capability improvement to elements of human and technical interoperability
- Address critical CIM capability gaps
- Expand the visibility and reach of information management programs
- Implement concrete measures in a systematic way
- Comply more fully with relevant international standards

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Operational Performance Outcomes

- **Currently under development**
  - Aligns with the Interoperability Continuum
  - Aligns with the CMM
- **Examples:**
  - Reduce the resource request and acquisition process from 48 hrs to 6 hrs
  - Reduce the time it takes to establish baseline situational awareness in an event from 6 hours to 1 hour

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Field Implementation Process Overview

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Field Implementation Process

Step 1: Baseline CMM Diagnostic Assessment

Step 2: Facilitate Stepwise Training Process

Step 3: Conduct Exercise

Step 4: Exercise Evaluation

Step 5: Post-Exercise CMM Diagnostic Assessment

Step 1: Baseline CMM Diagnostic Assessment

- Assessment process: 2-4 hours
- May be conducted simultaneously with many organizations
- Provides a common conceptual framework
- Provides indication of steps required to advance capability maturity

Step 1: Baseline CMM Diagnostic Assessment

Figure 15: IMIS CMM Concept

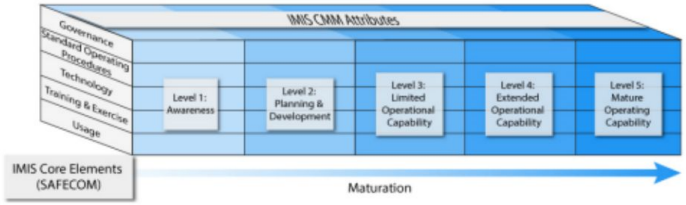

Figure 16: Revised IMIS CMM Self-Assessment Tool (Excerpt)

IMIS CMM Governance Element	Organization 1
Level 0: No Capability	
Level 1: Awareness	
GV101 - My organization acknowledges the value of information sharing for the purpose of incident management, and intend to establish working groups to implement operational capabilities.	☐
GV102 - Personal connections enable some information sharing and collaboration to occur.	☐
GV103 - Technical staff implement non-standard governance activities on behalf of My organization.	☐
GV104 - My organization recognizes that information sharing activities will require dedicated staff and funding.	☐
GV105 - My organization has internal executive-level support for the development of an information sharing program that supports the needs of incident management.	☐
Level 2: Planning and Development	
GV201 - An Executive Committee has been established to focus on the task of information sharing for the purpose of incident management. Members represent functions that include multi-agency leadership.	☐
GV202 - A Working Group has been established to focus on design and implementation of an effective governance framework that supports incident management information sharing.	☐
GV203 - Working groups have been established to address SOPs, Technology, Training and Exercises, and Usage with defined cross-collaboration and meeting schedules.	☐
GV204 - My organization has an information sharing strategy that aligns with various local and national strategies/policies.	☐
GV205 - My organization has an action plan in place to monitor progress made on information sharing	

Step 1: Baseline CMM Diagnostic Assessment

Figure 19: Sample National Baseline CMM Self-Assessment Summary

IMIS CMM Baseline National Self-Assessment Report v1		
Entity Name:	BiH	
Entity Population Est:	3.5M	
Person Completing:	Joel Thomas, SPIN Global (DHS Contractor)	
Date Completed:	4/6/17	
Governance	Level % Complete	Total % Complete
Level 1: Awareness	100	37
Level 2: Planning & Development	28	
Level 3: Limited Operational Capability	13	
Level 4: Extended Operational Capability	22	
Level 5: Mature Operating Capability	24	
Standard Operating Procedures	Level % Complete	Total % Complete
Level 1: Awareness	88	45
Level 2: Planning & Development	33	
Level 3: Limited Operational Capability	37	
Level 4: Extended Operational Capability	42	
Level 5: Mature Operating Capability	26	
Technology	Level % Complete	Total % Complete
Level 1: Awareness	100	51
Level 2: Planning & Development	52	
Level 3: Limited Operational Capability	35	
Level 4: Extended Operational Capability	24	
Level 5: Mature Operating Capability	45	

Step 1: Baseline CMM Diagnostic Assessment

Figure 20 - Regional Baseline CMM Self-Assessment Summary

IMIS CMM Regional Baseline Self-Assessment Results Summary Report for NATO SPS ARCECP Pilot Participants (April 2017)

BOSNIA & HERZEGOVINA	Level % Complete	Total % Complete
Governance		
Level 1: Awareness	100	
Level 2: Planning & Development	28	
Level 3: Limited Operational Capability	13	37
Level 4: Extended Operational Capability	22	
Level 5: Mature Operating Capability	24	
Standard Operating Procedures		
Level 1: Awareness	88	
Level 2: Planning & Development	33	
Level 3: Limited Operational Capability	37	45
Level 4: Extended Operational Capability	42	
Level 5: Mature Operating Capability	26	
Technology		
Level 1: Awareness	100	
Level 2: Planning & Development	52	
Level 3: Limited Operational Capability	35	51
Level 4: Extended Operational Capability	24	
Level 5: Mature Operating Capability	45	
Training and Exercise		
Level 1: Awareness	100	
Level 2: Planning & Development	43	
Level 3: Limited Operational Capability	44	57
Level 4: Extended Operational Capability	47	
Level 5: Mature Operating Capability	53	
Usage		
Level 1: Awareness	100	
Level 2: Planning & Development	54	
Level 3: Limited Operational Capability	19	49
Level 4: Extended Operational Capability	36	
Level 5: Mature Operating Capability	35	
NATIONAL % COMPLETE		48

CROATIA	Level % Complete	Total % Complete
Governance		
Level 1: Awareness	87	
Level 2: Planning & Development	37	
Level 3: Limited Operational Capability	29	41
Level 4: Extended Operational Capability	39	
Level 5: Mature Operating Capability	13	
Standard Operating Procedures		
Level 1: Awareness	82	
Level 2: Planning & Development	48	
Level 3: Limited Operational Capability	26	43
Level 4: Extended Operational Capability	28	
Level 5: Mature Operating Capability	29	
Technology		
Level 1: Awareness	88	
Level 2: Planning & Development	43	
Level 3: Limited Operational Capability	45	45
Level 4: Extended Operational Capability	25	
Level 5: Mature Operating Capability	22	
Training and Exercise		
Level 1: Awareness	83	
Level 2: Planning & Development	78	
Level 3: Limited Operational Capability	51	58
Level 4: Extended Operational Capability	44	
Level 5: Mature Operating Capability	35	
Usage		
Level 1: Awareness	69	
Level 2: Planning & Development	47	
Level 3: Limited Operational Capability	28	37
Level 4: Extended Operational Capability	22	
Level 5: Mature Operating Capability	17	
NATIONAL % COMPLETE		45

MACEDONIA	Level % Complete	Total % Complete
Governance		
Level 1: Awareness	69	
Level 2: Planning & Development	32	
Level 3: Limited Operational Capability	31	41
Level 4: Extended Operational Capability	48	
Level 5: Mature Operating Capability	25	
Standard Operating Procedures		
Level 1: Awareness	71	
Level 2: Planning & Development	36	
Level 3: Limited Operational Capability	31	42
Level 4: Extended Operational Capability	34	
Level 5: Mature Operating Capability	39	
Technology		
Level 1: Awareness	63	
Level 2: Planning & Development	18	
Level 3: Limited Operational Capability	29	32
Level 4: Extended Operational Capability	24	
Level 5: Mature Operating Capability	24	
Training and Exercise		
Level 1: Awareness	98	
Level 2: Planning & Development	36	
Level 3: Limited Operational Capability	29	49
Level 4: Extended Operational Capability	40	
Level 5: Mature Operating Capability	41	
Usage		
Level 1: Awareness	58	
Level 2: Planning & Development	75	
Level 3: Limited Operational Capability	29	40
Level 4: Extended Operational Capability	21	
Level 5: Mature Operating Capability	16	
NATIONAL % COMPLETE		41

MONTENEGRO	Level % Complete	Total % Complete	Regional % Complete
Governance			
Level 1: Awareness	75		
Level 2: Planning & Development	6		
Level 3: Limited Operational Capability	47	46	41
Level 4: Extended Operational Capability	59		
Level 5: Mature Operating Capability	44		
Standard Operating Procedures			
Level 1: Awareness	51		
Level 2: Planning & Development	52		
Level 3: Limited Operational Capability	37	46	44
Level 4: Extended Operational Capability	36		
Level 5: Mature Operating Capability	52		
Technology			
Level 1: Awareness	32		
Level 2: Planning & Development	18		
Level 3: Limited Operational Capability	28	30	40
Level 4: Extended Operational Capability	30		
Level 5: Mature Operating Capability	42		
Training and Exercise			
Level 1: Awareness	71		
Level 2: Planning & Development	60		
Level 3: Limited Operational Capability	28	47	53
Level 4: Extended Operational Capability	40		
Level 5: Mature Operating Capability	38		
Usage			
Level 1: Awareness	52		
Level 2: Planning & Development	53		
Level 3: Limited Operational Capability	66	51	44
Level 4: Extended Operational Capability	37		
Level 5: Mature Operating Capability	47		
NATIONAL % COMPLETE		44	

IMIS CMM REGIONAL % COMPLETE
45

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Capability Assessment Summary Report

April 2017

Prepared For:

Advanced Regional Civil Emergency Coordination Pilot (ARCECP) Participants in Bosnia & Herzegovina, Croatia, Macedonia, and Montenegro

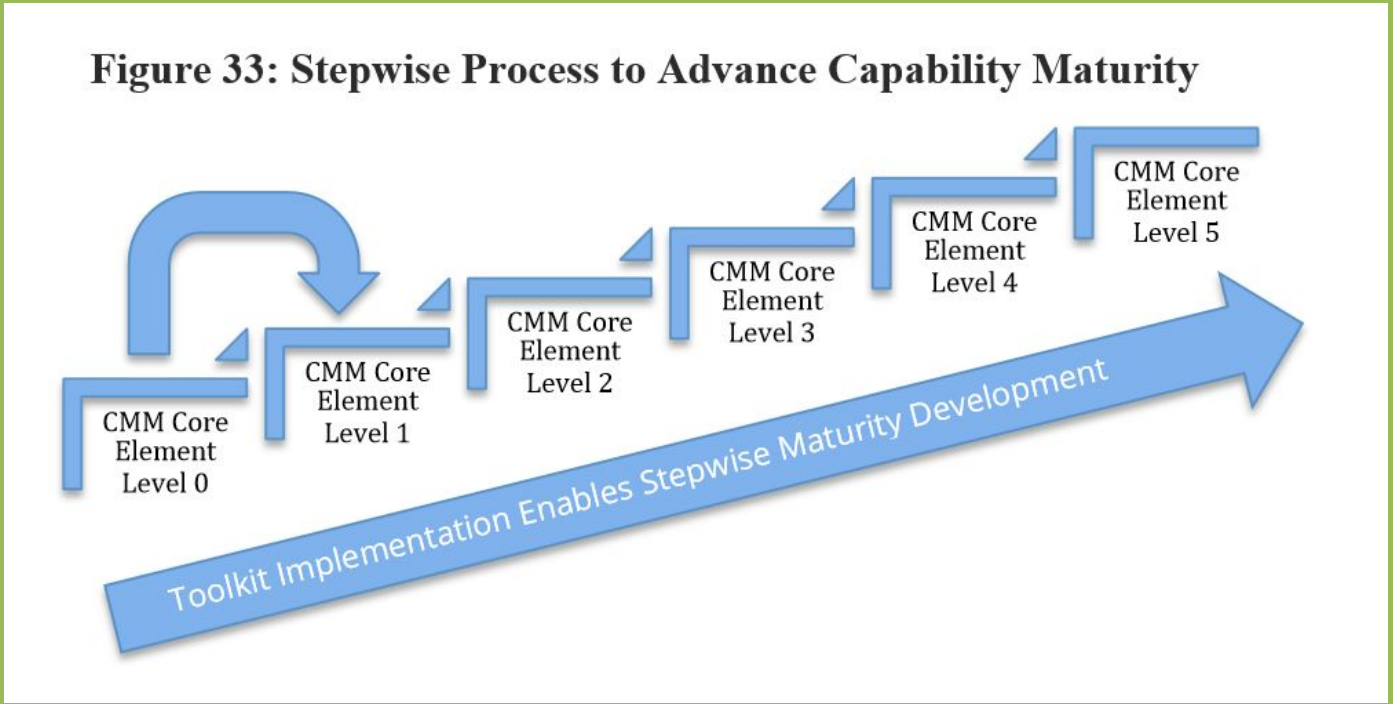
The North Atlantic Treaty Organization (NATO) Science for Peace & Security (SPS) Programme

U.S. Department of Homeland Security (DHS) Science & Technology Directorate (S&T)

Prepared By:

Joel Thomas, SPIN Global

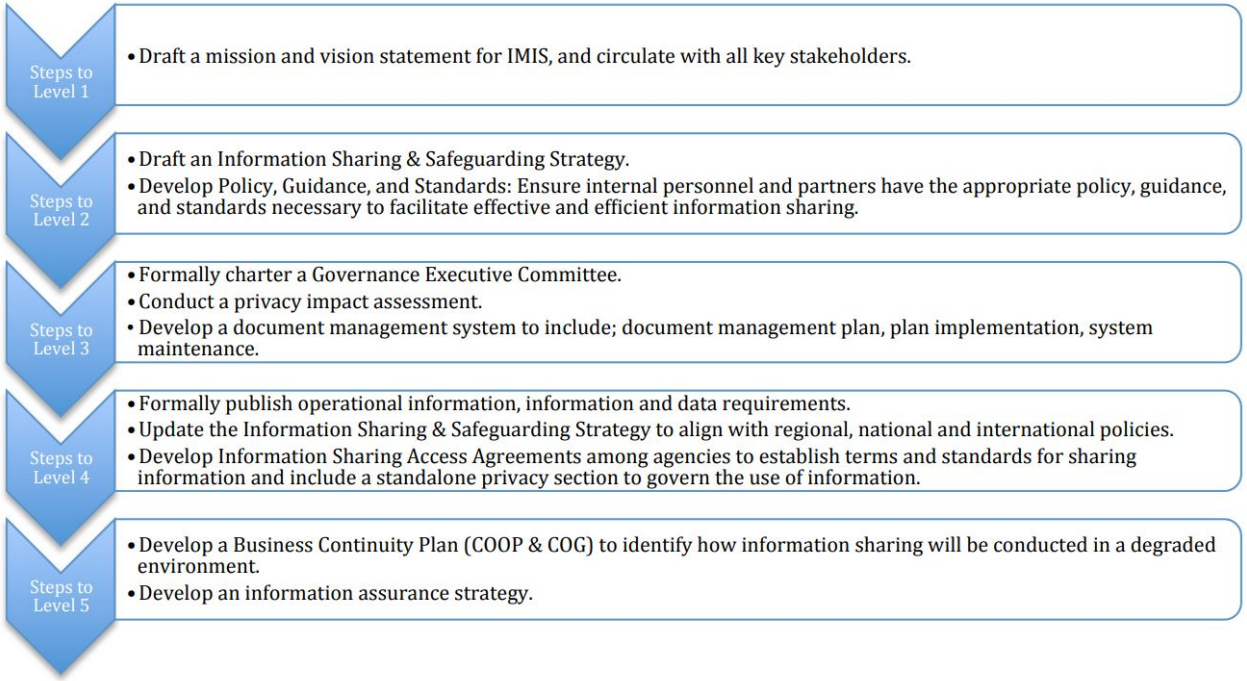
Step 2: Facilitate Stepwise Training Process



Step 2: Facilitate Stepwise Training Process

4.3.1.1. *Steps to Improve Governance*

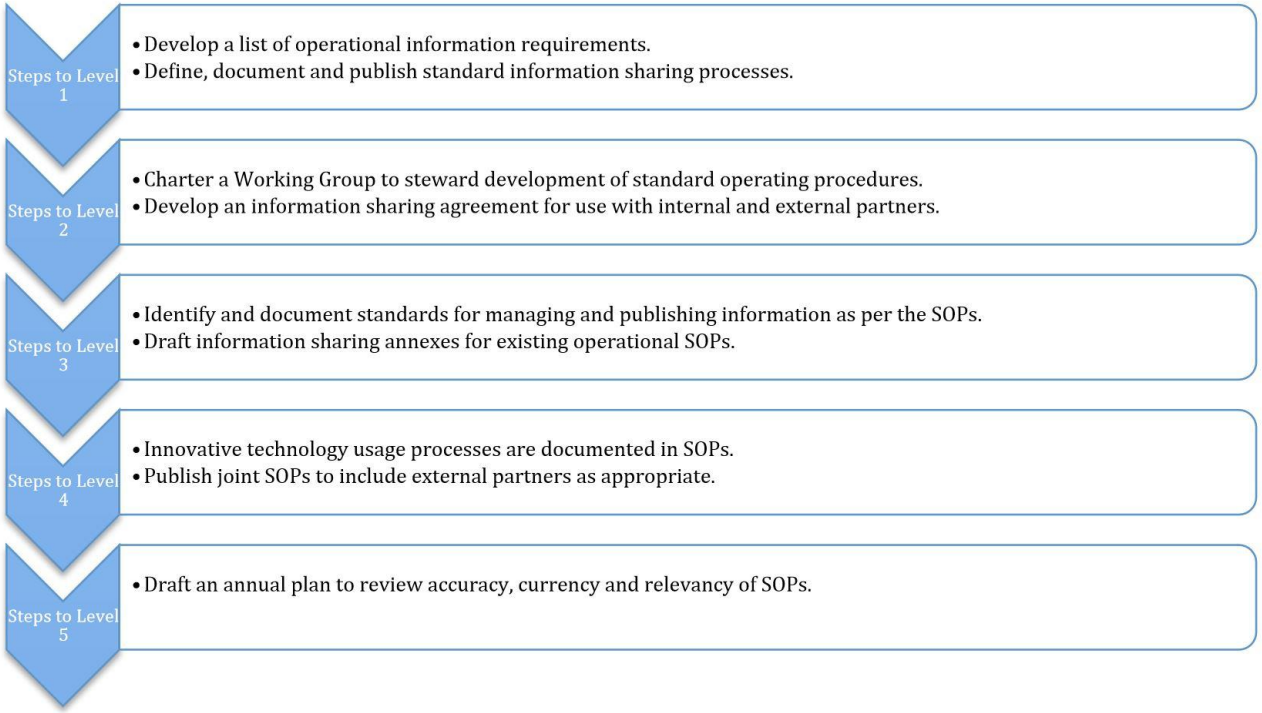
The following diagram illustrates a stepwise model to improve the maturity of the CMM core element "governance", with a complementary list of resources available online.



Step 2: Facilitate Stepwise Training Process

4.3.1.2. *Steps to Improve Standard Operating Procedures*

The following diagram illustrates a stepwise model to improve the maturity of the CMM core element "standard operating procedures" , with complementary resources online.



Step 2: Facilitate Stepwise Training Process

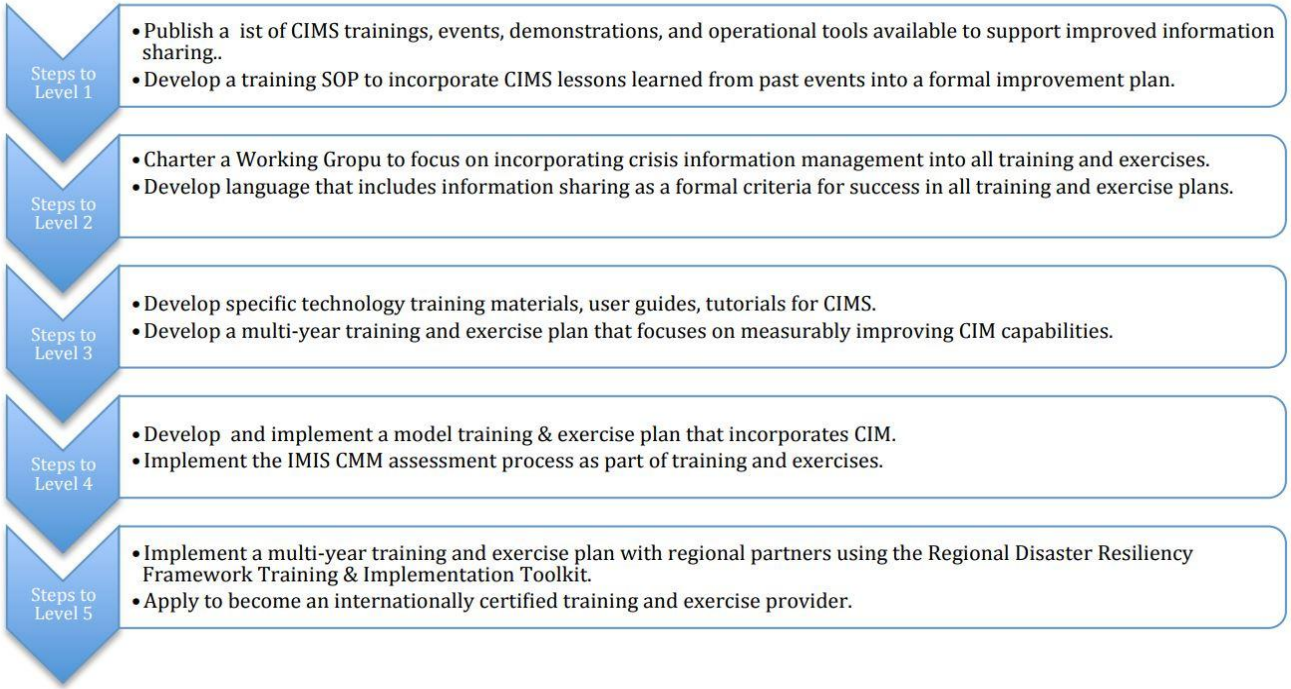
4.3.1.3. *Steps to Improve Technology*

The following diagram illustrates a stepwise model to improve the maturity of the CMM core element "technology", with a complementary list of resources available online.

Step 2: Facilitate Stepwise Training Process

4.3.1.4. *Steps to Improve Training & Exercises*

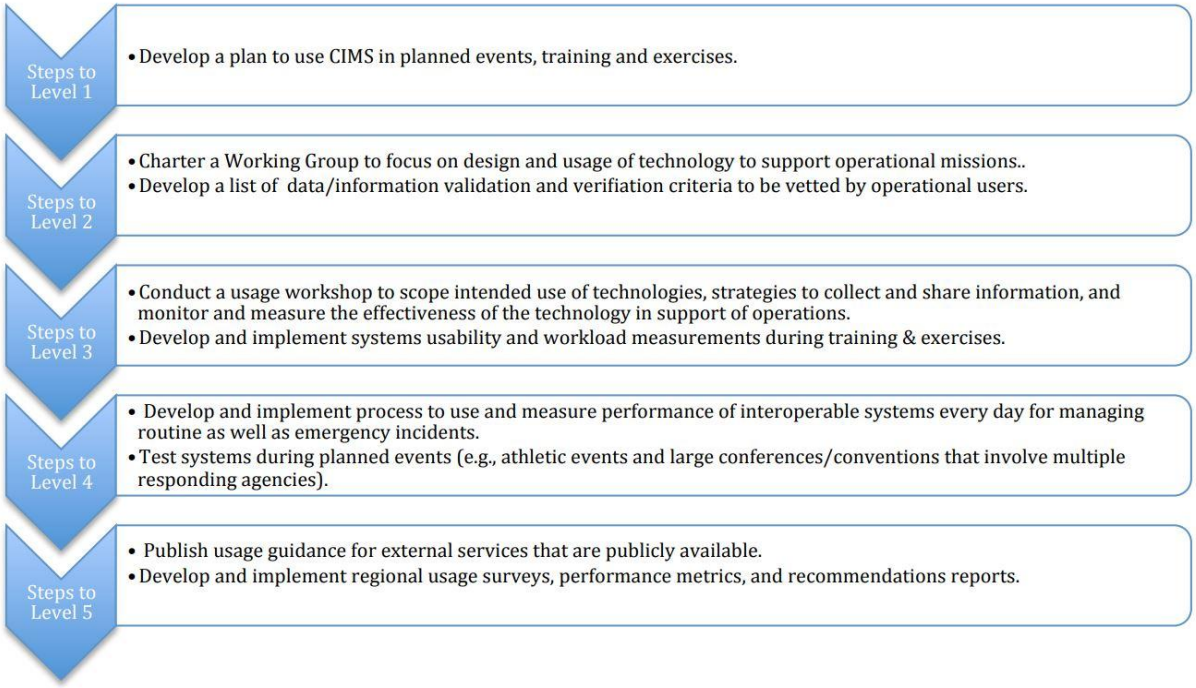
The following diagram illustrates stepwise model to improve the maturity of the CMM core element "training and exercises", with a complementary list of resources online.



Step 2: Facilitate Stepwise Training Process

4.3.1.5. *Steps to Improve Usage*

The following diagram illustrates a stepwise model to improve the maturity of the CMM core element "usage", with a complementary list of resources available online.



Step 3: Conduct Exercise

Figure 28: Sample Exercise Overview

Advanced Regional Civil Emergency Coordination Pilot (ARCECP) Exercise Overview

Scope: Limited Play Exercise Vignette in the EADRCC Field Exercise in Bosnia & Herzegovina

NATO EADRCC consequence management field exercise

"Bosna I Hercegovina 2017"

Jointly organized by the **EADRCC** and

the **Ministry of Security** of Bosnia and Herzegovina

Date:	September 24-29, 2017
Participants:	NATO EADRCC, NATO SPS ARCECP Program Participants, 39 nations
ARCECP Program Exercise Scope:	Test & evaluate the Next Generation Incident Command System (NICS) in a limited play exercise vignette, focused on a flood rescue scenario at/near Modrac Lake. Water rescue teams from Croatia, Montenegro and BiH will deploy. Information sharing through NICS will be tested and evaluated by water rescue teams, incident command locations, base of operations, and remote support locations of supporting countries and international support organizations.
Location:	Modrac Lake near Tuzla, Bosnia & Herzegovina
Personnel Required:	ARCECP NICS Users in BiH, Croatia, Macedonia & Montenegro

Figure 29: Sample Exercise Schedule

ARCECP Program Schedule for the NATO EADRCC Consequence Management Field Exercise - Bosnia & Herzegovina 2017

ALL TIMES LOCAL	Monday, September 25 NICS Training Day	Tuesday September 26 Training & Command Post TTX	Wednesday, September 27 Field Exercise Day 1	Thursday, September 28 Field Exercise Day 2	Friday, September 29 Demonstration Day
8:00		Kickoff	NICS Training	NICS Training	
9:00	Opening Ceremonies	NICS Training	Exercise	Exercise	Exhibition
9:30					
10:00					Demonstration
10:30					
11:00					
11:30					
12:00	Lunch	Lunch	Lunch	Lunch	Lunch
12:30					
13:00					
13:30	NICS Training	Command Post TTX	Exercise	Exercise	Day 5 Hotwash / AAR Discussion
14:00					
14:30					
15:00					
15:30					
16:00	Day 1 Hotwash	Day 2 Hotwash	Day 3 Hotwash	Day 4 Hotwash	
16:30					

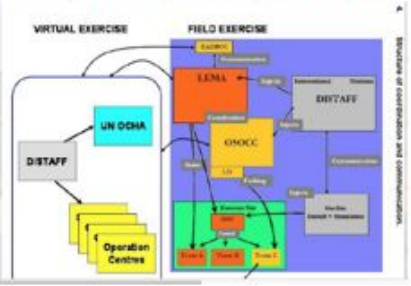
Step 3: Conduct Exercise

Figure 30: Sample Exercise Logistics

ARCECP Exercise Logistics

	Location	Primary Participants	Main Point of Contact	NICS Users
Primary Participants	**Name:** Modrac Lake **Lat/Long:**	Croatia Water Rescue Team	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: Modrac Lake **Lat/Long:**	BiH Water Rescue Team	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: Modrac Lake **Lat/Long:**	Montenegro Water Rescue Team	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: Modrac Lakeshore **Lat/Long:**	Local Emergency Management Agency (LEMA) Incident Command	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: Tuzla **Lat/Long:**	Base of Operations (LEMA, DISTAFF, OSOCC)	Name: Agency: Mobile: Email:	Username: Username: Username:

	Location	Secondary Participants	Main Point of Contact	NICS Users
Secondary Participants	**Name:** Tuzla **Lat/Long:**	BiH emergency operations center	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: Zagreb, Croatia Operations Center **Lat/Long:**	Country-specific civil emergency protection centers	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: Podgorica, Montenegro Operations Center **Lat/Long:**	Country-specific civil emergency protection centers	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: Skopje, Macedonia Operations Center **Lat/Long:**	Country-specific civil emergency protection centers	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: Brussels, Belgium EADRCC Operations Center **Lat/Long:**	NATO EADRCC	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: Brussels, Belgium ERCC Operations Center **Lat/Long:**	European Commission ERCC	Name: Agency: Mobile: Email:	Username: Username: Username:
	Name: UN OCHA Virtual OSOCC **Lat/Long:**	UN Virtual OSOCC	Name: Agency:	Username: Username:



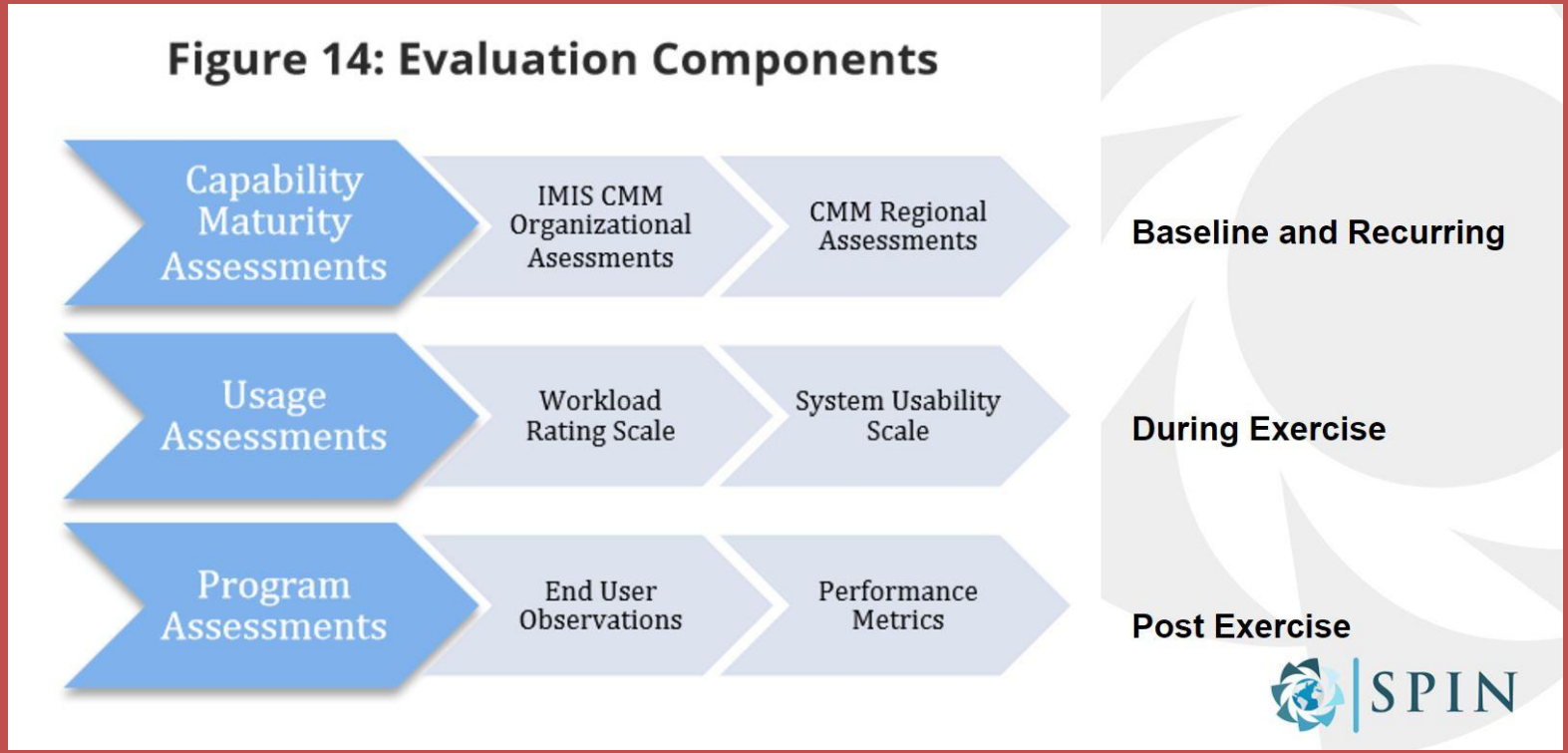
Step 3: Conduct Exercise

Figure 31: Sample Exercise Playbook (MSEL)

NATO-NICS EADRCC BOSNIA & HERZEGOVINA REGIONAL EXERCISE PLAYBOOK

Unique ID	Operational Phase(s)	Operational Mission Requirements	Description	Inject Mode	Responsible Actors	Recipient Players	Expected Actions	Information & Data Requirements	Information Sharing Requirements	Lat	Long	Notes
Steady State - 1	Normal Response	Cross-border planning for humanitarian assistance	Share flood hazard mitigation plans	NICS	Civil emergency protection agencies	Civil emergency protection personnel in national and international partner organizations	Step 1: Create plans Step 2: Share plans Step 3: Visualize & share plans	Contours defining the geographic area of concern, modeled impact analysis including extent and severity level of the hazard.	With BiH, Croatia, Macedonia, Montenegro and EADRCC			
Steady State - 2	Normal Response	Monitor daily forecast	Monitor local, national and regional weather reports and forecasts	NICS	Hydrometeorological agencies, weather services	Civil emergency protection personnel in national and international partner organizations	Step 1: Create daily forecast Step 2: Share daily forecast Step 3: Visualize & share daily forecast	Daily forecasts may include severe weather, geological, active threat, and/or special event notices. Include timestamp.	With BiH, Croatia, Macedonia, Montenegro and EADRCC			
Steady State - 3	Elevated Threat	Establish elevated threat forecast	Establish areas of concern, modeled impacts	NICS	Hydrometeorological agencies, weather services, civil emergency protection agencies	Civil emergency protection personnel in national and international partner organizations	Step 1: Create forecast Step 2: Share forecast Step 3: Visualize & share forecast	Contours defining the geographic extent and severity level of the hazard, using the appropriate hazard-relevant scale and timestamp.	With BiH, Croatia, Macedonia, Montenegro and EADRCC, ERCC, OSOCC			
Steady State - 4	Credible Threat	Send and receive alerts, warnings and notifications	Develop and send a message with specific instructions for officials and citizens	NICS	Civil emergency protection agencies	Civil emergency protection personnel in national and international partner organizations	Step 1: Create alert message Step 2: Send alerts Step 3: Visualize & share alerts	Alert message content, geographic extent and severity level of the threat, instructions for officials and citizens, timestamp.	With BiH, Croatia, Macedonia, Montenegro and EADRCC			
Steady State - 5	Credible Threat	Pre-position response assets	Identify pre-event resource needs and initiate pre-deployment of assets (where applicable)	NICS	Civil emergency protection agencies	Civil emergency protection personnel in national and international partner organizations	Step 1: Identify response assets Step 2: Pre-deploy response assets Step 3: Visualize & share asset activities	Resource name, owner, type, capability, cost per day, proximity to site. Timestamp.	With BiH, Croatia, Macedonia, Montenegro and EADRCC			
Response - 1	Immediate Response	Conduct impact analysis to determine scale of operations	Impacted communities and support organizations assemble field reports and determine scale of operations	NICS	Civil emergency protection agencies	Civil emergency protection personnel in national and international partner organizations	Step 1: Conduct impact analysis Step 2: Determine scale of operations Step 3: Vizualize & share results	Contours defining the geographic extent and severity level of the hazard, using the appropriate hazard-relevant scale and timestamp. Description of scale of operations.	With BiH, Croatia, Macedonia, Montenegro and EADRCC, ERCC, OSOCC			
Response - 2	Immediate Response	Activate response coordination centers and first responders	Based upon scale of operations, a determination is made to activate at local, national or international level(s)	NICS	Civil emergency protection agencies	Civil emergency protection personnel in national and international partner organizations	Step 1: Activate response Step 2: Issue task orders Step 3: Visualize & share status updates	Provide situation reports for each activated response mechanism on a rolling basis. Timestamp and visualize results based upon geographic location.	With BiH, Croatia, Macedonia, Montenegro and EADRCC, ERCC, OSOCC			
Response - 3	Immediate Response	Identify and request resources that need to be deployed	Based upon the impact analysis, it is determined that flood water rescue teams are needed	NICS	Civil emergency protection agencies	Water Rescue DISTAFF, Civil emergency protection personnel in national and international partner organizations	Step 1: Identify resource requirement Step 2: Submit request for assistance Step 3: Visualize asset locations at home station	Requestor, resource type, resource amount, location, RFA document, asset locations at home station. Timestamp and visualize results based upon geographic location.	With BiH, Croatia, Macedonia, Montenegro and EADRCC, ERCC, OSOCC			
Response - 4	Deployment	Transport resources to the affected area of concern	Flood water rescue teams are transported from BiH, Croatia and Montenegro to Modrac Lake	NICS	Civil emergency protection agencies, LEMA, Base of Operations	Water Rescue DISTAFF, Civil emergency protection personnel in national and international partner organizations	Step 1: Determine transit route Step 2: Mobilize assets Step 3: Visualize asset movements	Geospatially display transit routes, asset movements, estimated times to arrival, and deployment locations.	With BiH, Croatia, Macedonia, Montenegro and EADRCC, ERCC, OSOCC			
Response - 5	Deployment	Conduct tactical field missions and task orders from incident commanders	Flood water rescue teams conduct missions and track progress	NICS	Water Rescue Teams, Incident Command	Water Rescue DISTAFF, Civil emergency protection personnel in national and international partner organizations	Step 1: Issue task orders Step 2: Conduct water rescue missions Step 3: Report status of missions	Water rescue site, task order, asset location, status reports.	With BiH, Croatia, Macedonia, Montenegro and EADRCC, ERCC, OSOCC			
Response - 6	Sustained Response	Tactical field missions status updates (rolling)	Flood water rescue teams provide status updates to the incident command and base	NICS	Water Rescue Teams	Water Rescue DISTAFF, Civil emergency protection personnel in national and	Step 1: Report status of mission Step 2: Visualize sitrep	Water rescue site, task order, asset location, status reports.	With BiH, Croatia, Macedonia, Montenegro and EADRCC, ERCC			

Step 4: Exercise Evaluation



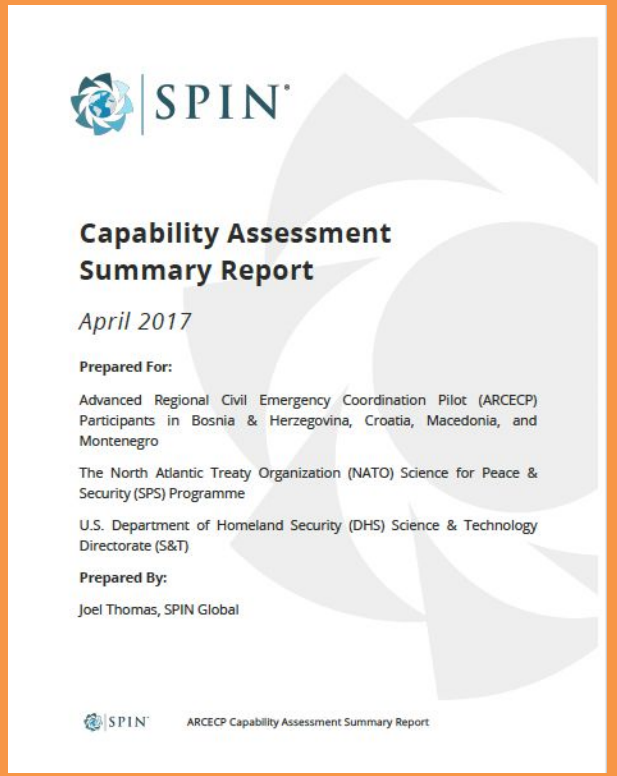
Step 5: Post-Exercise CMM Assessment

This step includes:

- CMM Assessment 6-9 months after the exercise
- CMM Assessment with same group of organizations that participated in the baseline assessment
- Side-by-side analysis of CMM Assessment Summary Results

Key Outputs:

- Re-Assessment Summary Report
- Revised training plan based on the Stepwise Process to Advance Capability Maturity
- Revised program plan for the next cycle of development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SPIN ARCECP Capability Assessment Summary Report

Questions?

Joel Thomas

Chief Executive Officer

SPIN Global

jthomas@spinglobal.co

202-731-8018