

**SUBCOMMITTEE ON
CONSEQUENCE ASSESSMENT
AND PROTECTIVE ACTIONS
(SCAPA)**

**ANNUAL REPORT OF MAY 2008
THROUGH APRIL 2009 ACTIVITIES**

April 2009

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1.0 Introduction

This compilation of information represents the 4th annual report of the programs associated with the Subcommittee for Consequence Assessment and Protective Actions (SCAPA).

1.1 SCAPA Charter

The SCAPA Charter remains unchanged from last year and can be located on the EMI SIG SCAPA web page.

1.2 Annual Reports

Annual reports, describing the SCAPA activities, will be prepared as long as the program is active for presentation to the EMI SIG Steering Committee, the first May of every year.

2.0 May 2008 Annual Meeting and Teleconferences

2.1 May 2008 Annual Meeting

SCAPA convened its annual meeting at the Hyatt Hotel in Reston, VA, on Thursday, May 8, 2008, in conjunction with the Emergency Management Issues Special Interest Group (EMI SIG) meeting. Fifty (50) individuals from the public and private sectors participated.

The primary purpose of the annual SCAPA meeting is to provide a forum for the almost 100 SCAPA participants to review its accomplishments, products, and projects and to discuss its present and future missions. A total of 21 technical presentations of interest to the membership, including those from the five (5) active SCAPA Working Groups and the National Atmospheric Release Advisory Capability (NARAC) User Group, were delivered.

Dave Freshwater, NA-41 SCAPA Federal Official, welcomed everyone. Carl Mazzola reviewed the important points that were discussed and decisions that were made during the 2007 San Antonio, TX SCAPA Meeting and briefly discussed the report that documented the highlights of the meeting. The 2007 SCAPA Meeting Report has been posted on the web site. Carl also mentioned that the third SCAPA Annual Report was developed, which included the activities of 92 individuals associated with the program. Cliff Glantz presented the highlights of that report to the EMI SIG Steering Committee. Carl then reviewed the status of the remaining open action items and their proposed disposition. Twenty (20) additional presentations were made during the rest of the day on SCAPA working group (WG) activities and on other topics of interest to the SCAPA membership. There were also guest speakers from the Environmental Protection Agency (EPA), Defense Threat Reduction Agency (DTRA), and the National Biodefense Analysis and Countermeasures Center (NBACC).

At the end of the day, Carl Mazzola and Cliff Glantz conducted a brief roundtable discussion of SCAPA program priorities and recapped the meeting. Carl reviewed the action items, and indicated when the next SCAPA meeting will be conducted. All existing action items will be periodically reviewed by NA-41 through future teleconferences, the next of which is scheduled for July 2008. Each of the five SCAPA WGs will meet just prior to the next SCAPA meeting and report on its activities at the next SCAPA meeting.

The following table identifies the fifty (50) individuals that attended the meeting and their respective company affiliations.

Last	First	Company	E-Mail
Baumann	Brian	Fluor-Hanford	
Bond	Jayne-Anne	Advanced Technology Laboratories (ATL) International	
Brekke	David	Sandia National Laboratory (SNL)-California	
Cheng	Jeng	NA-41	Jeng.chang@nnsa.doe.gov
Ciolek	John	Alpha-TRAC Incorporated	jciolek@alphatrac.com
Craig	Doug	ATL International	craigdk@earthlink.net
Davis	Richard	Washington Savannah River Company (WSRC)	Richard.davis@srs.gov
Davis	Wayne	Washington Safety Management Solutions (WSMS)-Aiken	Wayne.davis@wsms.com
Estep	James	NBACC	
Freshwater	Dave	NA-41	David.freshwater@nnsa.doe.gov
Gibeault	Gerald	BEA-Idaho Falls	
Gibson	Thomas	National Institute of Health (NIH)	
Glantz	Cliff	Pacific Northwest National Laboratory (PNNL)	Cliff.glantz@pnl.gov
Henderson	Sam	Science Applications International Corporation (SAIC)	
Hickey	Eva	Pacific Northwest National Laboratory (PNNL)	Eva.hickey@pnl.gov
Hunt	Patty	TJSO	
Hunter	Chuck	Savannah River National Laboratory (SRNL)	Chuck.hunter@srl.doe.gov
Jamison	Jim	SAIC	Jamisonj@saic.com
Jivelekas	April	WSMS-Mid-America	
Kabela	Erik	SRNL	Erik.kabela@srl.doe.gov
Knazovich	Michael	SNL	
Long	Jeff	Oak Ridge National Laboratory (ORNL)	
Lu	Po-Yung	ORNL	lupy@ornl.gov
Luckett	Steve	NA-41	
Marsick	Daniel	DOE/HS-31	
Martin	Greg	SAIC	martingr@saic.gov
Mazzola	Carl	Shaw Environmental, Incorporated (SEI)	Carl.mazzola@shawgrp.com
McDougall	Vernon	ATL International	
Mikkola	Brenda	Value Added Solutions (VAS)	

Miles	Jim	Defense Threat Reduction Agency (DTRA)	
Myers	Dave	DTRA	
Nasstrom	John	National Atmospheric Release Advisory Capability (NARAC)	John.nasstrom@llnl.gov
O'Shaunnessy	Michele	DOE	
Petrocchi	Rocky	URS	rocky.petrocchi@wgint.com
Possidente	Bill	NSTec	
Powers	Jim	NA-41	jim.powers@nnsa.doe.gov
Rishel	Jeremy	PNNL	Jeremy.rishel@pnl.gov
Roberto	Frank	Idaho National Laboratory (INL)	Francisco.roberto@inl.gov
Sen	Subir	DOE/HS Central Registry	
Thomas	Richard	Intercet	rthomas@intercet.com
Tobin	Paul	Environmental Protection Agency (EPA)	
Trent	Joel	DOE/ID	
Tuccinardi	Tom	ATL International	ttuccinardi@adelphia.net
Tupin	Edward	EPA	
Wagner	Brian	National Institute of Health (NIH)	
Ward	Kerry	BEA-Idaho Falls	
Winner	Gary	Argonne National Laboratory (ANL)	
Wolfgram	Michele	WSMS-Mid-America	Michele.wolfgram@wsms.com
Young	Ken	Lawrence Livermore National Laboratory (LLNL)	
Yu	Xiao-Ying	PNNL	

A meeting report was developed and can be accessed at the following address:
<http://www.ornl.gov/emi/scapa/Meeting-2008/meetinghighlights.htm>.

2.2 Teleconferences

Five (5) SCAPA teleconferences took place between May 2008 and April 2009 in order to maintain continuity of the program activities. Highlights were prepared and they can be accessed under the *SCAPA Teleconference Highlights* heading at the following web address: <http://www.ornl.gov/emi/scapa/news.htm>.

These teleconferences took place on the following dates:

- July 9, 2008: 29 individuals took part;
- September 17, 2008: 16 individuals took part;
- December 3, 2008: 31 individuals took part;
- March 3, 2009: 26 individuals took part; and,
- April 21, 2009: XX individuals took part.

Seventy-eight (78) different individuals participated in at least one of the above SCAPA teleconferences or attended the 2008 SCAPA Meeting.

3.0 Working Group Accomplishments

The five (5) SCAPA WGs were involved in a total of nine (9) projects from May 2008 through April 2009. The following briefly describes these projects by WG.

3.1 Chemical Exposures WG

The Chemical Exposures WG (CEWG) was involved in three (3) specific projects from May 2008 through April 2009. The following summarizes each effort and correlates it to its action items or activity description:

1. **AI 05-03**: The PAC/TEEL SQA effort continued to move forward. The PAC/TEEL development procedure, QA procedures, configuration management plan, PAC/TEEL methodology cookbook with step-by-step procedures, CMM Workbook and User's Guide update, and performance of additional Verification & Validation (V & V) work on CMM, are all active projects.
2. **AI 07-02**: Completed PAC/TEELs Revision 24, which total 3,356 chemicals.
3. **PAC/TEEL Revision 25**: Under development to address both Acute Exposure Guideline Limit (AEGL) and regulatory updates. Exact date of release is pending NA-41 decision regarding incorporation of concentration-limit (i.e., regulatory) updates.

3.2 Chemical Mixtures WG

The Chemical Mixtures WG (CMWG) was involved in two (2) specific projects from May 2008 through April 2009. The following summarizes each effort and correlates it to its action items:

1. **AI 06-15**: Additional resources were applied to successfully work off a backlog of approximately 900 chemicals. The CMM workbook has been revised with User Manual and both available on EMI SIG web page.
2. **AI 07-14**: The HCN methodology technical paper continues to be developed, and when completed, will be published in the *Journal of Applied Toxicology*, or other peer-reviewed journal.

3.3 Consequence Assessment Modeling WG

The Consequence Assessment Modeling WG (CAMWG) was involved in one (1) specific project from May 2008 through April 2009. The following summarizes that effort and correlates it to its action item:

1. **AI 06-01**: Conducting ongoing dialogue with DOE/HS on SQA (DOE O 414.1C and DOE G 414.1-4) regarding implementation for consequence assessment applications. Developing guidance for consequence assessment models used for emergency response applications, as well as meteorological data.

3.4 Biosafety WG

The Biosafety WG (BWG) was involved in three (3) specific projects from May 2008 through April 2009. The following summarizes each effort and correlates it to its action item(s):

1. **AI 06-06**: NA-41 directed SCAPA to address the following issue: *“The transport and dispersion of biological agents/toxins released from DOE/NNSA biosafety facilities was left an open subject in the BioEMG. What models are available and appropriate for predictions, especially for lab size source terms, and NOT production quantities? What are the limits to the use of Gaussian models? What other modeling tools are available or being developed? Because a level of severity will likely not be available for defining a Protective Action Criterion (PAC), how will modeling results best be used?”* A draft report on needs and current status is under preparation which will include consideration of existing atmospheric models, and limitations for purpose of application, indoor air quality models (e.g., CONTAM), a summary on a published study modeling an indoor anthrax release, recommendations for future study and integration, and a recommendation that the ID50 term be used to consider relative severity of release of various viable microbial, fungal, and viral agents.
2. **AI 08-01**: Lessons learned White Paper to relate the various labs' experiences implementing requirements of 151.1C and G 151.1-5 has been cancelled.
3. **AI 08-02**: List of biotoxins for consideration in PAC/TEELs Rev 25 was developed.

3.5 Source Term WG

The Source Term WG (STWG) was not involved in any specific projects from May 2008 through April 2009.

4.0 Web Page

The SCAPA webpage continues to be a living document, reflecting the work of SCAPA that its members are conducting. A substantial number of improvements and updates were made to the SCAPA website on a regular basis. These included:

- Modifications to the SCAPA main page;
- Modifications to the SCAPA News webpage;
- Modifications to the PAC webpage
- Modifications to the DMCC webpage;
- Modifications to the STWG webpage; and,
- Revisions to the SCAPA contact list and updates to the reference link webpage.

5.0 Action Items

On May 1, 2008, there were six (6) open SCAPA action items. The following shows the progress on each of these antecedent action items during May 2008 through April 2009:

AI No.	Description	5/1/08 Status	4/30/09 Status
05-03	SQA Plan for TEEL and CMM software	Report concluded code executing properly. Software custodian, an updated procedure, other SQA documentation, and Configuration Management Plan (CMP) are needed. PAC SQA documentation is virtually complete. PAC development procedure in revision and various QA procedures, as well as SQA Plan, under development. A CMP to be developed in FY08.	<p>This activity requires the preparation of: (1) TEEL development procedure, (2) QA procedures, (3) configuration management plan, (4) TEEL methodology cookbook with step-by-step procedures, (5) CMM Workbook and User's Guide update, and (6) performance of additional Verification & Validation (V & V) work on CMM.</p> <p>The following status on this multi-task AI is noted: (1) "TEELs Methods and Practice" handbook issued in October 2008; (4) TEELs "Cookbook", a written description of what PAC macros implement, is under TAG+ review; and all other tasks are at various points of completion.</p>
06-01	Central Registry SQA and Toolbox implementation	<p>SCAPA Toolbox: SCAPA Toolbox will require a graded level of SQA. NARAC, ARCON96, 2DPUF, APGEMS, CAP88PC, and RASCAL are SCAPA Toolbox candidates. NA-41 emphasized that this effort should be prioritized. SQA Guidelines and consequence assessment modeling being performed by Alpha TRAC through their Data Quality Objectives (DQOs) effort. Work is based on meeting DOE O 414.1C and DOE G 414.1-4, with an emphasis on configuration management, V & V and preparation of a SQA Plan. Product is essentially complete. Once SQA procedures are available, SQA work can move forward in earnest.</p> <p>Central Registry: HOTSPOT gap analysis issued April, 2007. HOTSPOT to close 5 critical recommendations to be in Central Registry toolbox by March 2008. A later version of MACCS2 may soon be submitted to the Registry to close the gaps in the gap analysis. CAPARS may be considered for toolbox.</p>	<p>SCAPA Toolbox: Developing guidance for consequence assessment models used for emergency response applications, as well as meteorological data. Product is scheduled for official release in May 2009 and will provide standards for admitting models into SCAPA toolbox.</p> <p>Central Registry: Conducting ongoing dialogue with DOE/HS (Subir Sen) on SQA (DOE O 414.1C and DOE G 414.1-4) and poised to address questions regarding implementation for consequence assessment applications and to play active role in any future redrafting of SQA Order or Guide. Meeting with Subir Sen delayed until May 2009. Meeting will focus on determining what is necessary to satisfy the Registry's toolbox requirements, so this AI can be brought to closure.</p>

AI No.	Description	5/1/08 Status	4/30/09 Status
06-06	Transport and dispersion of biological agents/toxins for BioEMG	Indoor dispersion models (i.e., CONTAM, COMIS, IAQX) being evaluated and a literature search initiated. INL has made preliminary runs with CONTAM code and a presentation will be made at the 10 th EP & R Topical Meeting. LBNL also has a mature indoor modeling capability (COMIS), which is highly dependent on building configuration and HVAC design. Dina Matz volunteered to develop SCAPA project plan to move forward with this project which may result in the development of infective dose values, or ranges, for various infectious agents.	Draft report on needs and current status will be released for SCAPA review by May 2009, which will include consideration of existing atmospheric models, and limitations for purpose of application, indoor air quality models (e.g., CONTAM), a summary on a published study modeling an indoor anthrax release, recommendations for future study and integration, and a recommendation that the ID50 term be used to consider relative severity of release of various viable microbial, fungal, and viral agents. Report will provide a basis for a SCAPA recommendation to NA-41 to develop policy and guidance on transport and dispersion of biological agents/toxins.
06-15	Revisions to existing HCNs using revised CMM HCN development procedure	HCN effort needs additional resources to work off backlog of approximately 700 chemicals. Future intern should play an important role in working off HCN backlog. Rocky Petrocchi to revise HCN development procedure. CMM workbook has been revised with User Manual and both available on EMI SIG web page.	HCNs have been developed for all chemicals through PAC/TEELs Revision 24. COMPLETE.
07-02	PAC/TEELs Revision 24	Focus of PACs Revision 24 will be on quality assuring older PACs and developing PACs for new chemicals that have been requested from NA-41 since publication of PAC Revision 23A. Will include columns for derivation date, source of PACs, LELs and NFPA HHRs, targeted for May 2008 EMI SIG/SCAPA.	PAC/TEELs Revision 24 has been issued. COMPLETE.
07-14	HCN technical paper	CMM HCN technical paper targeted for end of CY08.	Draft one-page outline ready for SCAPA review. Journal article targeted for 12/31/09.

Two (2) of the 4 antecedent action items were satisfied and closed by April 30, 2009 leaving 4 remaining active action items (i.e., 05-03, 06-01, 06-06, and 07-14).

Two (2) new SCAPA action items were opened from May 2008-April 2009. The following shows the status these action items:

AI No.	Description	4/30/09 Status
08-01	May 2008 BWG Meeting: NA-41 representative suggested development of White Paper by BWG on how to implement DOE O 151.1C with a focus NA-41's objectives (e.g., infected host scenario) rather than addressing unrealistic scenarios.	Lessons learned White Paper that would relate the various labs' experiences implementing requirements of 151.1C and G 151.1-5 under development was suggested. However, this was resolved in another way. COMPLETE.

08-02	<p>May 2008 BWG Meeting: Since there are a limited number of biotoxins (i.e., 24) and some acute health effect information exists (i.e., ID₅₀), BWG will develop a list of these for consideration in the Revision 25 PAC/TEEL effort.</p>	<p>After consultation with BWG, a list of agents was compiled for submission to TAG. Rocky Petrocchi asked for some help in understanding toxins to assist TAG, and BWG identified some toxins of interest already in PAC/TEEL Revision 24. A revised list was submitted for review and action on October 16.</p> <p>COMPLETE.</p>
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Both of the new action items were satisfied and closed.

Therefore, on April 30, 2009, 4 action items were still open, highlighted in green.

6.0 May 2009-April 2010 Activities and Priorities

Prioritization of the following projects and activities will be solely based on NA-41 guidance at the biannual SCAPA program meetings, and at other meetings and teleconferences with SCAPA leadership.

6.1 Chemical Exposures WG

Anticipated Chemical Exposures WG activities for May 2009 – April 2010 are as follows:

1. Continue to undertake full PAC/TEEL SQA effort on methodology macros and develop all documentation requirements identified in DOE G 414.1-4. Establish a software custodian and develop a procedure for updating the macros;
2. Continue effort to upgrade PAC/TEELs that were developed in the 1990s with more recent chemical toxicological information and studies;
3. Continue to track the progress of the ERPGs and AEGLs and integrate developments into PAC/TEEL Revision 25 work activity;
4. Complete Revision 25 PAC/TEELs, post them on the SCAPA web page and include this information in the searchable PAC/TEELs data base;
5. Begin development of Revision 26 PAC/TEELs on new chemicals submitted by DOE/NNSA sites, if required;
6. Develop EMUs to announce future significant CEMG events; and,
7. Address emerging chemical exposure technical projects, as appropriate.

6.2 Chemical Mixtures WG

Anticipated Chemical Mixtures WG activities for May 2009 – April 2010 are as follows:

1. Develop HCNs for the new PAC Rev 25 chemicals, QA the results, incorporate into new CMM Rev 25 workbook and test;
2. Continue to undertake full SQA effort on HCN methodology and develop all documentation requirements identified in DOE G 414.1-4; and,
3. Address emerging chemical mixture technical projects, as appropriate.

6.3 Consequence Assessment Modeling WG

Anticipated Consequence Assessment Modeling WG activities for May 2009 – April 2010 are as follows:

1. Continue refining the DOE/NNSA SQA self-assessment strategy and candidate toolbox models;
2. Oversee the process of establishing new toolbox codes and interface with the DOE/EH Central Toolbox Registry, as appropriate;
3. Interface with NARAC through its advisory group and assist it with its issue resolution and its relationship with SCAPA, as appropriate;
4. Maintain awareness of the revised EPA PAGs and DHS PALs;
5. Interface with the DMCC; and,
6. Address emerging consequence assessment modeling projects, as appropriate.

6.4 Biosafety WG

Anticipated Biosafety WG activities for May 2009 – April 2010 are as follows:

1. Develop a response to NA-41 issue on the limits of Gaussian models relative to the transport and dispersion of bioagents and bioweapons;
2. Continue periodic BWG teleconferences that will mature its work;
3. Continue involvement with the American Biosafety Safety Association (ABSA);
4. Interface, as appropriate with DOE nanotechnology initiatives;
5. Address emerging biosafety projects, as appropriate.

Note: BWG members are supporting DOE participation in the Federal Biosecurity Working Group which will provide a report to President Obama in July, 2009.

6.5 Source Term WG

Anticipated Source Term WG activities for May 2009 – April 2010 are as follows:

1. Continue periodic STWG teleconferences that will mature its work;
2. Interface with the Hazards Assessment Subcommittee (HASubC), as appropriate; and,
3. Address emerging source term projects, as appropriate.

6.6 Web Page

SCAPA webpage activities for May 2009 – April 2010 are expected to include:

1. Addition of a SQA webpage;
2. Update the *Consequence Assessment Modeling Toolbox* webpage;
3. Update the *TEELs* webpage; and,
4. Modification and enhancement to the *SCAPA News* webpage.

7.0 Conclusions

The SCAPA program had yet another very successful year during the May 2008 through April 2009 period.

- A well-attended and broad-based SCAPA Meeting was held on May 8 in Reston, VA, and five teleconferences were held throughout the year. The SCAPA meeting had its second largest number of attendees (i.e., 50) in its 20-year history.
- Seventy-eight individuals participated in some form in the program and all five WGs were active.
- All NNSA/DOE sites continue to show strong interest in the SCAPA programs, as evidenced by the number of individuals attending the SCAPA meeting and the teleconferences.

There are reasonable strong expectations for an even more productive year during the May 2009 through April 2010 time period.

The next SCAPA Meeting has been scheduled for May 7, 2009 in San Francisco, CA. There will be meetings of each SCAPA WG, TAG, and the NARAC User Group at the EMI SIG Meeting.

8.0 ACRONYMS

The following is a list of acronyms used in this report:

A

ABSA	American Biosafety Sciences Association
AEGL	Acute Exposure Guideline Level
ANS	American Nuclear Society
ANL	Argonne National Laboratory
ATL	Advanced Technology Laboratories

B

BNL	Brookhaven National Laboratory
BWG	Biosafety Working Group

C

CA	California, Consequence Assessment
CAMWG	Consequence Assessment Modeling Working Group
CAPARS	A consequence assessment code
CDC	Centers for Disease Control
CEWG	Chemical Exposure Working Group
CMM	Chemical Mixture Methodology
CMWG	Chemical Mixtures Working Group
COMIS	An indoor air quality code
CONTAM	An indoor air quality code
CY	Calendar Year

D

DC	District of Columbia
DHS	Department of Homeland Security
DMCC	DOE Meteorological Coordinating Council
DOE	Department of Energy
DOE/HSS	DOE Office of Health Safety and Security
DTRA	Defense Threat Reduction Agency

E

EMG	Emergency Management Guide
EMI SIG	Emergency Management Issues Special Interest Group
EMU	Emergency Management Update
EOC	Emergency Operations Center
EP	Emergency Planning
EPA	Environmental Protection Agency
EPHA	Emergency Preparedness Hazard Assessment
EP & R	Emergency Preparedness & Response
ERPG	Emergency Response Planning Guideline

F

FY	Fiscal Year
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G

G	Guide
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H

HASubC	Hazards Assessment Subcommittee
HCN	Health Code Number
HHR	Health Hazard Rating
HOTSPOT	An atmospheric transport and dispersion code

I

ID ₅₀	Infectious Dose for 50 % of the population
INL	Idaho National Laboratory

J

K

L

LANL	Los Alamos National Laboratory
LEL	Lower Explosive Level
LLNL	Lawrence Livermore National Laboratory

M

M & O Management and Operations
MACCS2 A consequence assessment code

N

NA-41 DOE Office of Emergency Management
NARAC National Atmospheric Release Advisory Center
NBACC National Biodefense Analysis and Countermeasures Center
NFPA National Fire Protection Association
NIH National Institute of Health
NM New Mexico
NNSA National Nuclear Security Administration
NV Nevada

O

O Order
OEM Office of Emergency Management
ORISE Oak Ridge Institute for Science and Education
ORNL Oak Ridge National Laboratory
OROO Oak Ridge Operations Office

P

PAC Protective Action Criterion
PAG Protective Action Guide
PAL Protective Action Level
PNNL Pacific Northwest National Laboratory

Q

R

S

SAIC	Science Applications International Corporation
SC	South Carolina
SCAPA	Subcommittee on Consequence Assessment and Protective Actions
SEI	Shaw Environmental Incorporated
SNL	Sandia National Laboratory
SQA	Software Quality Assurance
SRNL	Savannah River National Laboratory
SROO	Savannah River Operations Office
SRS	Savannah River Site
STD	Standard
STWG	Source Term Working Group

T

TAG	TEEL Advisory Group
TEEL	Temporary Emergency Exposure Limit
TX	Texas

U

V

V & V	Verification & Validation
VA	Virginia
VAS	Value Added Solutions

W

WG	Working Group
WSMS	Washington Safety Management Solutions
WSRC	Westinghouse Savannah River Company

X

Y

Z