17th Meeting of the DMCC

Las Vegas, Nevada
May 3, 2010

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Executive Summary

The Department of Energy (DOE) Meteorological Coordinating Council (DMCC) convened a meeting at the Renaissance Hotel, Las Vegas, NV on May 3, 2010. This meeting was held in conjunction with the Emergency Management Issues (EMI) Special Interest Group (SIG) Annual Meeting. DMCC is a program that was created in 1994 and has been under the oversight of the EMI SIG since 2004.

This year was the 17th DMCC Meeting since its inception on December 2, 1994. A total of 15 individuals from the public and private sectors attended and actively participated in the meeting.

The purposes of this meeting were to provide a forum for DMCC members and DMCC associates to review accomplishments, products, and projects; discuss the mission and implementation of its organizational goals; and resolve outstanding objectives during the meeting. The following was accomplished:

1. NNSA/DOE site meteorological program managers were provided an opportunity to discuss their programs and to obtain feedback from the DMCC membership on various issues they were facing.

2. NNSA/DOE site meteorological program managers made technical presentations on relevant operational and research topics to the DMCC membership to enhance their knowledge of the atmospheric sciences and assist them in their program execution.

3. The results of recent DMCC Assist Visits (AVs) were presented.

4. The status of ANSI/ANS meteorological monitoring and consequence assessment standards development was given.

5. New DMCC products were discussed, and the DMCC Assist Visit program was reviewed.

6. A brief DMCC Business Meeting was convened to discuss relevant NNSA/DOE meteorological program issues and where DMCC should be focusing its energies in FY11 and beyond.

7. Discussions on the FY10 accomplishments and FY11 planning of the DMCC took place.

Additionally, early planning for the 18th DMCC Meeting was briefly discussed. This meeting will be held in conjunction with the next EMI SIG Meeting in Charleston, SC on May 2, 2011.

1.0 Overview

The DOE Meteorological Coordinating Council (DMCC) convened at the Renaissance Hotel, Las Vegas, NV on May 3, 2010. This was the 17th meeting that DMCC has sponsored since its inception on December 2, 1994. The meeting was called to order by the DMCC Chairman, Walt Schalk, who is also the Director, National Oceanic and Atmospheric Administration (NOAA) Air Resources Laboratory Special Operations & Research Division (ARLSORD).

This meeting, facilitated by John Merrick, presented new DMCC initiatives to its membership and associates, shared the many DMCC accomplishments over the past 15-1/2 years, and provided discussions on recent advancements in the atmospheric sciences to the DMCC membership.

The following activities were accomplished at the meeting:

- NNSA/DOE site meteorological program managers or associates were provided an opportunity to discuss their programs and obtain constructive feedback from the DMCC membership on various issues they were facing.
- Several technical presentations on relevant operational and research topics were provided to the DMCC membership to enhance their knowledge of the atmospheric sciences and assist them in their program execution.
- New DMCC products were discussed.
- The DMCC Assist Visit Program was reviewed.
- The status of ANSI/ANS meteorological monitoring and consequence assessment standards development was given.
- The status of the eight ANS voluntary consensus standards was reviewed.
- A DMCC Business Meeting was convened to discuss relevant National Nuclear Security Administration (NNSA)/DOE meteorological program issues, and where DMCC should be focusing its energies in FY11 and beyond.

Thirteen members were in attendance at the meeting and two other members attended remotely via Microsoft Live Meeting. The 15 attending members and their respective affiliations are listed below:

DMCC Meeting Attendees

Tom Bellinger	BWXT Y-12 (Live Meeting)
Kevin Birdwell	Oak Ridge National Laboratory (ORNL)
John Ciolek	Alpha-TRAC
Kirk Clawson	NOAA ARLFRD (Live Meeting)
Dave Freshwater	NA-41
Cliff Glantz	Pacific Northwest National Laboratory (PNNL)-Hanford
Erik Kabela	Savannah River National Laboratory (SRNL)
Carl Mazzola	Shaw Environmental & Infrastructure (SE I)
Jeannie McBride	Oak Ridge Institute for Science and Education (ORISE)
John Merrick	Consultant (DOE/SR Retired)
John Nasstrom	Lawrence Livermore National Laboratory (LLNL) NARAC
Jeremy Rishel	Pacific Northwest National Laboratory (PNNL)/Hanford
Walt Schalk	NOAA ARLSORD
Kip Smith	NOAA ARLSORD
Steve Vigeant	Shaw Environmental & Infrastructure (SE I)

2.0 DMCC Business, Products, Projects and Activities

2.1 Overview of DMCC Activities

Walt Schalk, DMCC Chairman, presented an overview of the DMCC activities since its last meeting in May 2009. Walt indicated that the May 2009 meeting, which was held in San Francisco, CA, had 22 attendees. Some of the topics of presentation included Graphics Processing Units (GPUs) for high performance modeling, scalar versus vector winds, the Savannah River National Laboratory (SRNL) nocturnal field study, the Idaho National Laboratory (INL)/Environmental Protection Agency (EPA) sound barrier study, and the site Assist Visit (AV) Program that Carl Mazzola addressed at this meeting. Support to others included several articles posted to website, the development of a draft Consequence Assessment (CA) Self-Assessment Guide, and the development of the Software Quality Assurance (SQA) process. Support to the private sector involved continued positive relationship with the Nuclear Utility Meteorological data User Group (NUMUG), and supporting eight American National Standards Institute/American Nuclear Society (ANSI/ANS) meteorological monitoring and dispersion modeling standards.

Walt closed his discussion stating that the goals of the DMCC are to continue these activities and look for ways to assist the efforts of the Department of Energy/National Nuclear Security Administration (DOE/NNSA) site meteorological programs.

2.2 Assist Visit Program Update

Carl Mazzola provided an update of the successful DMCC AV program that has been conducting AVs since 1996. He reviewed the objectives of an AV, which are to evaluate all aspects of a DOE/NNSA site meteorological monitoring program and the meteorological aspects of the site Consequence Assessment (CA) program. The team looks at the adequacy of the program relative to fulfilling its present mission *requirements*, as well as expected future mission requirements, and evaluates the effectiveness of the program with respect to meeting its services to its site customers.

Carl gave an overview of the many program improvements resulting from meeting the recommendations from AVs. These included enhanced management awareness of meteorological program vitality to operations, Integrated Safety Management System (ISMS) and other programs, better deployment of human resources, better integration and deployment of technical resources through additional Full Time Equivalents (FTEs) or summer intern assistance. One site received a $240,000 capital improvement to purchase sonic anemometers and Sound Detector and Ranging (SODAR) equipment, while another site purchased a higher-resolution lightning detection system, and yet another received funding to develop a state-of-the-art CA model. The AVs also resulted in improvements to existing CA models. In all cases, there was better integration of the CA-meteorological monitoring interfaces. Some sites stated that there was improvement in severe weather monitoring and reporting, improved siting of its meteorological tower array, improved data acquisition and certification procedures, and improved calibration procedures. Lastly, some sites improved their existing interfaces with their State agencies.

Carl indicated that 24 performance criteria in ANSI/ANS-3.11(2005), which are captured in DOE/EH-0173 Chapter 4 and the DMCC Meteorological Monitoring Assessment Guide, are used for the meteorological monitoring portion of the AV and 20 performance criteria in DOE G 151.1-1 Series: Consequence Assessment are used for the CA portion of the AV. For each of these 44 performance criteria, it is determined whether its objective is met, partially met, or not met. These objectives address a full spectrum of program elements, and the observations and recommendations tie back to one or more specific objectives.

Carl mentioned that customer satisfaction interviews are also conducted and recorded in the body of the AV report. These customers and the programs supported are as follows:

1. Environmental Compliance (NESHAP, NPDES)
2. Emergency Management (EPHA, CA)
3. Integrated Safety Management (DSA, LCO, BIO)
4. Environment Safety & Health (OSHA PSM, RMP)
5. Environmental Monitoring (ASER, DOE O 458)
6. NEPA (EA, EIS, PEIS)
7. Operations
8. NNSA/DOE oversight and State agency interfaces (UDAC)

After the information is gathered, the AV team rolls it up into several noteworthy practices, and various observations and recommendations and determines the quantity of meteorological monitoring objectives and if CA objectives were met, partially met or not met with a cross-reference to the specific observation/recommendation that applies to that performance objective.

Carl stressed that theses AVs are governed by a no-fault posture, and addressing any program improvements is at the total discretion of site management according to its budget constraints and program priorities. DMCC is available for advice, upon request, after each AV and recommends a follow-up AV every three to four years, also upon request. Very importantly, there is full confidentiality of the results. The AV usually is comprised of a program specialist, a team leader for the meteorological monitoring portion, and a team leader for the CA portion.

2.3 DMCC Web Page

Cliff Glantz discussed some of the recent updates to the DMCC web page. There is a new Emergency Management Issues Special Interest Group (EMI SIG) website design. One potential design problem was discussed where only 50% of the width is used for web page content, resulting in a lot of unused gray border space on the web page. In contrast, the old website provided 30% more space for website content. Cliff suggested that EMI SIG should merge the menus.

Cliff also stated that DMCC leadership were not involved in the redesign of the web pages and did not get a chance to conduct a review prior to public release. Fortunately, problems that were found on the SCAPA website were not carried over to the new web pages due to the simplicity and relatively small size of the DMCC website.

Cliff closed the discussion with a path forward vision, which included fixing any detected technical and editorial problems, and emphasizing a simpler navigation menu design. He encouraged DMCC members to review the current web page content and submit comments and suggestions.

2.4 DMCC Web Forum

John Ciolek discussed the usage and content of the DMCC web forum.

3.0 Topics of General Interest

3.1 NUMUG/DOE Facility Meteorological Program Mini-Surveys

John Ciolek gave a status of the eight NUMUG/DOE facility meteorological program mini-surveys, which he has posted on the DMCC Web Forum.

3.2 Common Issues with Meteorological Networks

Erik Kabela, for Matt Parker, discussed some of the common issues encountered by the AV teams with DOE/NNSA meteorological networks.

3.3 ANS Meteorological Monitoring and Dispersion Modeling Standards

Carl Mazzola presented an overview of the ANSI/ANS national voluntary consensus standards (VCSs) that are being supported by DMCC members. The primary legislative driver is the 1995 National Technology Transfer and Advancement Act (NTTAA) and Office of Management and Budget (OMB) Circular A-119 that encourage the development of national standards that can be used by Federal agencies. The Nuclear regulatory Commission (NRC) has written Management Directive 6.5 to implement this within this regulatory body. Moreover, the DOE Technical Standards Project Office (TSPO) encourages the use of these standards. ANS is an ANSI-accredited Standards Development Organization (SDO) with an ANS Standards Administrator and a Standards Board with the following consensus committees and its scope:

1. Nuclear Facilities Standards Committee (NFSC): Siting, design, and operation of nuclear facilities (other than N17), including radioactive waste management, site remediation, and restoration

2. N16: Nuclear criticality safety

3. N17: Research reactors, reactor physics, radiation shielding and computational methods

4. RISC: Criteria and methods for risk assessment and risk management as applied to design and operation of nuclear facilities, including radioactive waste management, site remediation and restoration

Carl discussed the NFSC subcommittees that include: (1) ANS-21: Maintenance, Operations, Testing & Training; (2) ANS-22: Systems Design Criteria; (3) ANS-24: Modeling & Analysis; (4) ANS-25: Siting and Environmental; (5) ANS-26: Emergency Preparedness; (6) ANS-27: Fuel Cycle, Waste Management & Decommissioning; (7) ANS-28: HTGR Design Criteria; and, (8) ANS-29: Advanced Initiatives (Gen IIIA/IV, GNEP).

Carl defined a standard as a document to set forth requirements for design, manufacture, or operation of a piece of equipment, which can also address computer firmware and software. It is also a document to address necessary physical and functional features of equipment, and its safe application, or some combination of these. A standard has a specific structure which includes a

foreword to explain why the standard was created in the manner it is presented, a 1-2 paragraph scoping statement, definitions specifically applicable to understanding the standard, requirements in a format suitable to the subject matter, references, and one or more appendices to provide examples of application of standard or offer other non-mandatory explanations.

Carl then presented the purposes, working groups, and the status of the standards that the NDMCC are involved in:

- ANSI/ANS-2.3: Standard for Estimating Tornado, Hurricane and Extreme Straight-Line Wind Characteristics at Nuclear Facility Sites (Working Group (WG) draft ready for ANS-25 consensus review)
- ANS-2.15: Criteria for Modeling & Calculating Atmospheric Transport of Routine Releases from Nuclear Facilities (WG developing third draft)
- ANS-2.16: Criteria for Modeling & Calculating Atmospheric Transport of Accident Releases from Nuclear Facilities (WG will begin work after ANS-2.15 reaches ANS-25 consensus review)
- ANS-2.21: Criteria for Assessing Atmospheric Effects On the Ultimate Heat Sink (in NFSC consensus review)
- ANS-2.31: Standard for Estimating Extreme Precipitation at Nuclear Facility Sites (populating WG)
- ANSI/ANS-3.8.7(1995W):Criteria for Planning, Development, Conduct, and Evaluation of Drills and Exercises for Emergency Preparedness at Nuclear Facilities (PINS filed and WG being populated)
- ANS-3.8.10:Criteria for Modeling Real-time Accidental Release Consequences at Nuclear Facilities (WG will begin work after ANS-2.15 reaches ANS-25 consensus review)
- ANSI/ANS-3.11(2005): Determining Meteorological Information at Nuclear Facilities (under reaffirmation review)
- ANS-58.25: American National Standard Radiological Accident Offsite Consequence Analysis (Level 3 PRA) to Support Nuclear Installation Applications (WG draft almost ready for RISC consensus review)

3.4 Using Graphical Processing Units for Modeling

John Ciolek spoke about recent developments concerning the use of Graphical Processing Units (GPUs); a topic he introduced at the last DMCC meeting.

4.0 Round Robin: Best Practices and Lessons Learned from DOE/NNSA Sites

4.1 Savannah River National Laboratory

Erik Kabela reported on various SRNL projects, which were discussed at the last DMCC meeting.

4.2 Idaho National Laboratory

Kirk Clawson discussed National Oceanic and Atmospheric Administration (NOAA)/Idaho National Laboratory (INL) meteorological research and its major activities and accomplishments from 2008 to the present. A Memorandum of Agreement (MOA) resulted in DOE-ID providing improved funding, and the outlook for ARLFRD is positive for the next 2-3 years. The program emphasis is on the NOAA/INL Weather Center (NIWC) web page, on which weather statements and alerts are posted. In addition, the meteorological monitoring program has shown an exceptional (i.e., approximately 99%) data recovery rate. There is enhanced meteorological information dissemination, and ARLFRD is transitioning to using HYSPLIT to support CA.

Kirk mentioned that INL has additional and different weather requirements than the general public, and, accordingly, its meteorological program is designed to strengthen the severe weather warning capability for the INL. ARLFRD titles its communications as statements or alerts (i.e., watches, warnings) to avoid confusion with the alerts issued by the National Weather Service (NWS). These appear on the NIWC web page and in e-mail transmissions to the INL operations managers, emergency responders, and the Warning Communication Center (WCC). NOAA/INL weather statements/alerts include convective weather products (i.e., tornado, lightning, thunderstorm), non-precipitation products (i.e., wind and blowing dust statements), winter weather products (i.e., snow/blowing snow statement, wind chill statement) and fire weather products (i.e., fire weather statement).

Kirk shifted his focus to the current dispersion modelling status, in which it is moving to HYSPLIT and ALOHA as its main tools; with ALOHA for chemical releases and HYSPLIT for radiological and large chemical releases. HYSPLIT is a 3-dimensional Lagrangian particle model that better aligns with NOAA activities. However, there is an adaptation challenge associated with the transition from numerical forecasts to diagnostic models.

Kirk concluded his presentation with a discussion on the research conducted by ARLFRD. He briefly discussed the status of the road-side sound barrier tracer study that he presented to DMCC at last year's meeting. He lamented on the reality that both national and international attention and interest in atmospheric tracer studies is waning. Additional extramural research includes hurricane research, the WISDOMET probe, which is a Joint United States Forest Service (USFS)/NOAA study, and the Big Southern Butte renewable energy wind forecast improvement study.

4.3 Nevada Test Site

Walt Schalk reported on the operational support that ARL SORD provides the Nevada Test Site (NTS). One of the main items reported on was the ending of balloon launched radiosondes from

the Desert Rock Weather Observatory site (KDRA) at Mercury, NV on the NTS. Due to NNSA/Nevada Site Office funding reductions, and SORD unable to find funding from other organizations, continued upper-air operations at KDRA will cease on October 1, 2010. As a result, SORD is planning, if funding allows, to purchase a SODAR to obtain needed upper air data. However, SORD will retain their mobile balloon launched radiosonde capability to support forecasting and experimental support needs for the NTS. A side note: The NWS has been discussing installing a balloon launched radiosonde capability from their forecast office in Las Vegas.

4.4 Oak Ridge National Laboratory

Kevin Birdwell discussed some of the issues associated with his support to ORNL.

4.5 Y-12

Tom Bellinger discussed some of the issues associated with his support to Y-12.

4.6 Hanford

Cliff Glantz discussed the progress of the Hanford meteorological and CA program work in addressing the September 2008 observations and recommendations.

5.0 DOE/NNSA Site Meteorological Research

5.1 Spatial Climatology of the Wind Environment in the Central Great Valley of Eastern Tennessee

Kevin Birdwell presented his Ph.D. research to define the mesoscale flows in the valley-ridge morphology in the Central Great Valley of Eastern Tennessee where Y-12 and ORNL operate.

5.2 Relationship between Eastern Equatorial Pacific Ocean Sea Surface Temperatures and Precipitation at NTS

Kip Smith presented his research on the relationship between Eastern Equatorial Pacific Ocean sea surface temperatures (SSTs) and how that affects the precipitation on the NTS throughout the year. He showed typical Continental United States (CONUS) temperature, precipitation and jet stream patterns during El Niño winters and presented a table that shows the location, elevation, and average monthly precipitation for the 12 stations used in this study with the NTS precipitation index calculated from its 12 stations from October 1964 – March 2010.

Kip presented a SST data map showing the El Niño regions and discussed the recent evolution, current status and predictions of the El Nino Southern Oscillation (ENSO) cycle. He then presented several graphical representations of his analysis and subsequent results. The most recent El Niño began in May 2009. Anomalously warm SSTs in the eastern equatorial Pacific (i.e., El Niño) usually are associated with abnormally wet weather from late fall through the following spring on the NTS. In contrast, anomalously cool SSTs (i.e., La Niña) usually are associated with abnormally dry weather from late fall through the following spring on the NTS.

Kip shared the results of this study, which show that the probabilities for above normal precipitation on the NTS from late-fall 2009 through spring-2010 were higher than those estimated from the corresponding Climate Prediction Center (CPC) outlooks, and that a wet winter was predicted for the NTS.

6.0 Acronyms

A

ANS	American Nuclear Society
ANSI	American National Standards Institute
ARL	Air Resources Laboratory
ASER	Annual Site Environmental Report
AV	Assist Visit

B

BIO	Basis for Interim Operations
BWXT	Y-12 M & O Contractor

C

CA	Consequence Assessment
CPC	Climate Prediction Center

D

D	Dimension
DMCC	DOE Meteorological Coordinating Council
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
DSA	Documented Safety Analysis

E

EA	Environmental Assessment
EIS	Environmental Impact Statement
EMI	Emergency Management Issues
EPA	Environmental Protection Agency
EPHA	Emergency Preparedness Hazard Assessment
ES & H	Environment Safety & Health

F

FRD	Field Research Division
FTE	Full-Time Equivalent
FY	Fiscal Year

G

G	Guide
GNEP	Global Nuclear Energy Program
GPU	Graphics Processing Unit

H

HS	Health, Safety & Security
HTGR	High Temperature Gas Reactor
HYSPLIT	An atmospheric transport and dispersion model

I

ID	Idaho
INL	Idaho National Laboratory
ISMS	Integrated Safety Management System

J - K

km	kilometer

L

LANL	Los Alamos National Laboratory
LCO	Limiting Condition for Operation
LLNL	Lawrence Livermore National Laboratory

M

MOA	Memorandum of Agreement

N

NA-41	Office of Nuclear Non-proliferation
NARAC	National Atmospheric Release Advisory Center
NEPA	National Environmental Policy Act
NESHAPS	National Environmental Standards for Hazardous Air Pollutants
NFSC	Nuclear Facilities Standards Committee
NIWC	NOAA/INL Weather Center
NNSA	National Nuclear Security Administration
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site
NTTAA	National Technology Transfer and Advancement Act
NUMUG	Nuclear Utility Meteorological data User Group
NWS	National Weather Service

O

O	Order
OMB	Office of Management and Budget
ORISE	Oak Ridge Institute for Science and Education
OSHA	Occupational Safety and Health Association

P

PNNL	Pacific Northwest National Laboratory
PRA	Probabilistic Risk Assessment
PSM	Process Safety Management

Q

QA	Quality Assurance

R

R & D	Research & Development
RISC	ANS Standards Consensus Committee
RMP	Risk Management Plan

S

SC	Office of Science
SCAPA	Subcommittee on Consequence Assessment and Protective Actions
SE I	Shaw Environmental & Infrastructure
SIG	Special Interest Group
SNL	Sandia National Laboratory
SODAR	Sonic Detection and Ranging
SORD	Special Operations & Research Division
SQA	Software Quality Assurance
SRNL	Savannah River National Laboratory
SST	Sea Surface Temperature

T

TSPO	Technical Standards Project Office

U

UDAC	Unified Dose Assessment Center
UHS	Ultimate Heat Sink
USFS	United States Forest Service

V

V & V	Verification & Validation
VCS	Voluntary Consensus Standard

W

WCC	Warning Communication Center
WG	Working Group

X – Y - Z