



SPACE WEATHER TABLETOP EXERCISE

PARTICIPANT READAHEAD

INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), and the Federal Emergency Management Agency (FEMA) are sponsoring a two-day Space Weather (SWx) tabletop exercise (TTX) with senior officials from key federal, state and local partners to assess preparedness and response procedures for a hypothetical space weather event. The TTX, which is being designed and coordinated by the Johns Hopkins Applied Physics Lab (APL), will be held on May 8th & 9th, 2024 with participants at two different venues – APL in Laurel, MD and the Denver Federal Center in Denver, CO. Options for virtual participation will be provided for those who cannot attend in-person. Senior leaders from federal agencies are encouraged to attend in person at APL in Laurel, MD.

This event will begin with space weather relevant tutorials to provide baseline information and to foster meaningful participation. The SWx scenario includes simulated, though realistic, notifications from NOAA's Space Weather Prediction Center (SWPC) and will evolve to include critical events prompting key decision makers at all levels of government to discuss relevant plans, policies and responses. In addition to the sponsors, participants will include senior leaders from the Colorado Division of Homeland Security and Emergency Management (DHSEM), Denver Office of Emergency Management (OEM), Department of Defense (DoD), Department of Homeland Security (DHS) Cybersecurity and Infrastructure Agency (CISA), Department of Energy (DOE), Department of Transportation (DOT), Environmental Protection Agency (EPA), Office of Science and Technology Policy (OSTP), and various other public safety and national security leaders.

TTX OBJECTIVES

The TTX objectives were derived in partnership with the sponsors, as well as space weather and emergency management subject matter experts and are aimed at helping to enhance our nation's space weather preparedness. As FEMA's designated Center of Excellence for Space Weather Prediction, FEMA Region 8 (R8) is a critical partner. During the TTX, FEMA R8 will serve as a "use case" opportunity for the rest of the nation in developing and sharing best practices, as well as lessons learned. The SWx TTX objectives include:

- 1) Assess effectiveness of communication protocols and pathways,
- 2) Enhance whole-of-government preparedness and response to a regional disaster and the widespread impact on the Nation's critical infrastructure,
- 3) Assess resiliency to increasingly degraded space assets due to a space weather event, and
- 4) Assess response to space weather effects in cislunar space.

SCENARIO SUMMARY

The hypothetical scenario involves a series of solar events that drive a range of adverse SWx effects on Earth and in near-Earth space. Solar activity, solar flares and coronal mass ejections (CME), have direct consequences and impacts on critical infrastructure, particularly when those events drive additional activity in Earth's atmosphere, ionosphere (i.e., the ionized gas or plasma in the upper atmosphere), and magnetosphere (i.e., the plasma on the protective magnetic field above the atmosphere and around Earth).

The scenario incorporates solar and geomagnetic activity resulting in hazards ranging from intense radiation exposure to satellites, astronauts, and commercial aviation, communication disruptions, loss of functionality or degraded GPS, satellite failures and on-orbit collisions, and power outages with impacts which could last for hours to days or longer.

PREPARATION

This TTX will provide a collaborative, low-stress, no-fault environment for participants to uncover various challenges associated with preparing for and responding to a space weather scenario that impacts the U.S. infrastructure. To help prepare, participants should become familiar with their organization's policies and procedures relevant to space weather events and are encouraged to share information during the exercise. Such information may include, but need not be limited to, preparedness and response procedures, space weather policies, organizational structures, contingency plans, public information sharing and communications protocols.

During the TTX, participants will engage in interactive dialogue regarding information needs and will also be given opportunities to enhance cross-agency communications and coordination. Preparation prior to the TTX will enable richer discussion. Provided below are a few examples of questions that will be posed. (Please note: The views expressed during the TTX will not be official government or organizational positions).

- How might your organization respond to an impending space weather event?
- With which partners and/or stakeholders would you be communicating and coordinating?
- What roles might your department/agency play?
- How would you develop and share crisis information regarding an impending space weather event?

SPACE WEATHER PRIMERS

NOAA – What is Space Weather

https://www.swpc.noaa.gov/sites/default/files/images/u33/swx_booklet.pdf

Space Weather 101 Short Video:

<https://www.youtube.com/shorts/YU6wms9hctc>

<https://www.youtube.com/shorts/3FHbn5wMfFs>

<https://www.youtube.com/shorts/zRrhDEK8yzo>

NOAA SWPC Resources:

<https://www.swpc.noaa.gov>

Federal Operation Concept for Impending Space Weather Events:

https://www.fema.gov/sites/default/files/2020-07/fema_incident-annex_space-weather.pdf

Space Weather for Hazard Mitigation & Emergency Management (webinar 10/11/23):

<https://piepc.org/october-2023-webinar/>

Implementation-Plan-for-National-Space-Weather-Strategy:

<https://www.whitehouse.gov/wp-content/uploads/2023/12/Implementation-Plan-for-National-Space-Weather-Strategy-12212023.pdf>

SWx Effects on Technology:

<https://www.nesdis.noaa.gov/events/space-weather-effects-technology>

Preparing the Nation for Space Weather:

<https://training.fema.gov/is/courseoverview.aspx?code=IS-66&lang=en>

For more information, please contact the TTX coordinator: spaceweatherttx@jhuapl.edu

