



Committee for Operational Processing Centers (COPC)

OPC (Data Source/Product) Outage Mitigation

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COPC AI Overview

COPC Action Item 2016-1.1: Refine the OPC outage mitigation priority list, identify candidate data exchanges, and investigate mitigation approaches for the highest priority items at each OPC. (Additionally, add a column that calls out the negatives when using the alternative data solution and make the document for internal OPC use only.)

Purpose: To increase the understanding of mission essential data exchange, single data sources, and data agency interdependencies, with the overall goal to mitigate the impacts on the OPCs when significant data outages occur.

- Added a column to highlight the negatives when using the alternative data solution.
- Marked the front of the document for internal OPC use only.

Mission Essential Data Exchanges Among OPCs -NAVO Data/Product Receipt														
OPC	Exchange Category	Data/Product Category	Data/Product Description	Data/Product Source(s)					Critical Impact Point (if loss of Data/Product)	Receive/Send Comm Path	Key Uses / Interdependencies	Outage Mitigation Strategy	Negatives when using the alternative data solution	Notes
				NCEP	NESDIS	FNMOG	557TH	OTHER						
NAVO	Receive	Altimetry	Jason-2		X					> 3 days	COPC OTN	METOC modeling/forecasting		Multiple altimetry data feeds are received and processed daily, delay or lack of an individual does not constitute critical outage. However, extended outage of multiple satellites impacts criticality.
NAVO	Receive	Altimetry	Jason-3		X					> 3 days	COPC OTN	METOC modeling/forecasting		See above.

Example



The Operational Processing Centers' Outage Mitigation Strategies for Critical Data Sources and Products

**** FOR INTERNAL OPC USE ONLY ****

Produced by the Working Group for Cooperative Support and Backup

Updated: July 14, 2016

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Primary OPC: NAVO

Critical Data/Product: Jason 3 produced altimetry.

Received: NAVO receives the Jason 3 data from the NEDIS/OSPO DAPE Gateway via the COPC Network.

Key Uses: NAVO uses this data to derive sea surface height anomaly for use in ocean models.

OPC Interdependencies: FNMOC uses the NAVO product in their atmospheric models; NESDIS for ocean heat content; and NCEP via the HYCOM initialization fields and SSHA product.

Critical Impact Point: After 3 days. Multiple altimetry data feeds are received and processed daily, delay or lack of an individual does not constitute critical outage. However, extended outage of multiple satellites impacts criticality. Other altimetry sources Jason-2, AltiKa, and Cryosat-2.

Mitigation Process: Receive the Jason 3 raw altimetry data from the Navy Research Lab at Stennis.

Communications Path: Internal Navy networks.

Initiation Timing: NAVO will contact NRL after 72 hours of not receiving Jason 3 data from NESDIS.

POCs: NAVO (?) and NRL (?)

Last Tested: NA – still in the planning and evaluation stage.

Negatives of the Alternative: Not 24x7 support so there could be a delay in implementing.

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Receiving Altimetry Data

- **Primary OPC:** NAVO
- **Critical Data/Product:** Altimetry (Jason 2, Jason 3, AltiKa, and Cryosat-2).
- **Received:** NAVO receives altimetry (J-2 & J-3, AltiKa, and Cryosat) data from the NESDIS/OSPO DAPE Gateway via the COPC Network.
- **Key Uses:** NAVO uses this data to derive sea surface height anomaly and wind/wave products for use in METOC models.
- **OPC Interdependencies:** FNMOC uses the NAVO product in their atmospheric models; NESDIS for ocean heat content; and NCEP via the HYCOM initialization fields and SSHa product.
- **Critical Impact Point:** After 2 days. Multiple altimetry data feeds are received and processed daily, delay or lack of an individual does not constitute critical outage. However, extended outage of multiple satellites impacts criticality.
- **Mitigation Process:** Receive the altimetry data from the Navy Research Lab at Stennis.
- **Communications Path:** Internal Navy networks.
- **Initiation Timing:** NAVO will access NRL server after 24 hours of not receiving datasets from NESDIS. NAVO desired methodology is automated access when primary feed is unavailable.
- **POCs:** NAVO (Carolyn Cooper) and NRL (Dr. Gregg Jacobs)
- **Last Tested:** NA – still in the planning and evaluation stage.
- **Negatives of the Alternative:** NRLSSC server is not supported 24x7, so there could be a latency impact.

Altimetry/MCSST Data Exchange Path

- **Primary OPC:** NAVO/NCEP
- **Critical Data/Product:** MCSST and altimetry derived products
- **Received:** NAVO provides essential SST, SSHa, and SWH products to NCEP.
- **Key Uses:** NCEP uses data for ingest into NWP and hurricane intensity models
- **OPC Interdependencies:** Maybe no interdependencies within OPCs.
- **Critical Impact Point:** After 2 days. Multiple SST and altimetry data feeds are received and processed daily, delay or lack of an individual does not constitute critical outage. However, extended interruption in delivery of multiple satellites impacts criticality
- **Mitigation Process:** Initiate/implement alternate delivery path
- **Communications Path:** NIPRNET/Internet
- **Initiation Timing:** After 24 hours, NAVO & NCEP will initiate/implement alternate delivery path
- **POCs:** NAVO (Tracy Lepire) and NCEP (Doug Fenderson)
- **Last Tested:** still in the planning and evaluation phase
- **Negatives of the Alternative:** Latency will be incurred in product delivery and monitoring/support is not 24x7. (Likely less useful once the COPC network is running through NFG and NIPRNet.)

Web Services

Primary OPCs: 557 WW/FNMOC/NAVO

Critical Data/Product/Service: Web Services – Outage Mitigation

Current Systems: Air Force Weather-Web Services (AFW-WEBS)/Naval Oceanography Portal

Key Uses: Display of data/products and hosting of applications

Critical Impact Point: Within 24-hours

Mitigation Process: Potential multiple levels of mitigation... from hosting key static image products (e.g., model output, space weather, volcano, etc.) to hosting meteorological tools and links (e.g., interactive meteorological techniques, forecaster tools, etc.) to hosting services or applications (e.g., upload of obs/TAFs/bulletins, display of A/N model output, precision airdrop system, etc.) on each other's portal.

Communications Path: Existing COPC circuits

Initiation Timing: OPC customers will access COPC partner portals immediately upon notification of projected extended outage of web services.

POCs: 557 WW (TBD), FNMOC (TBD) and NAVO (TBD)

Last Tested: NA – pre-planning stage.

DoD Observation and Forecast Exchange

- **Primary OPC:** NCEP/557WW
- **Critical Data/Product:** DoD Observations and TAF's
- **Received:** 557WW provides essential military observations and TAF's to NCEP.
- **Key Uses:** NCEP distributes data to key partners, such as FAA and uses data for ingest into NWP
- **OPC Interdependencies:** No interdependencies within OPCs.
- **Critical Impact Point:** Lack of observations has an immediate critical impact.
- **Mitigation Process:** Preliminary investigations of possible alternate delivery path provided by the 14th Weather Squadron
- **Communications Path:** NIPRNET/Internet
- **Initiation Timing:** Needs to be discussed among NCEP and 557WW
- **POCs:** NCEP (Carissa Klemmer, Doug Fenderson), 557WW (Ted Vroman)
- **Last Tested:** Still in the planning and evaluation phase
- **Negatives of the Alternative:** Resources needed for minimal down times due to redundant COPC paths

Receiving Atmospheric Motion Vectors (AMV) or Feature Track Winds (FTW)

Primary OPC: FNMOC Geostationary Satellite AMV and FTW products

Critical Data/Product: AMV or FTW from (NOAA GOES, Himawari, and METEOSAT - one of the largest data sets utilized for improving the skill of NAVGEM.

Received: FNMOC receives AMV and FTW from the NWSTG, U of W, and the NESDIS/OSPO DAPE Gateway via the COPC Network.

Key Uses: FNMOC uses this data to assimilate atmospheric data for use in METOC models.

OPC Interdependencies: NAVO uses the derived output receiving NAVGEM atmospheric initial boundary conditions to drive their oceanographic models; NCEP for use in evaluating FNMOC global NAVGEM NWP Ensemble runs and products; and 557th uses model output for oceanographic parameters.

Critical Impact Point: After 24 hours. Multiple AMV/FTW data feeds are received and processed daily, delay or lack of an individual does not constitute critical outage. However, extended outage of multiple satellites impacts criticality.

Mitigation Process: Receive the AMV/FTW data from University of Wisconsin which is a non DoD source sent via non DoD circuits. Risk is when INFOCON conditions go into effect.

Communications Path: Internal DoD DISA/Navy networks. Risk is using Internet.

Initiation Timing: FNMOC will access various servers all the time but assume increased IA risk after 24 hours of not receiving datasets via approved ATO circuits and sources. FNMOC desired methodology is automated access when primary feed is unavailable.

POCs: FNMOC (Randy Pauley) and FNMOC (Jim Vermeulen)

Last Tested: NA – currently being executed.

Negatives of the Alternative: U of W has no DoD ATO, so data could be cut off/ latency impacts.

AMV/FTW Data Exchange Path

- **Primary OPC:** FNMOC/NAVO
- **Critical Data/Product:** AMV/FTW and geostationary satellite derived products
- **Received:** FNMOC provides essential initial boundary conditions to NAVO.
- **Key Uses:** NAVO uses data for ingest into NWP oceanographic models
- **OPC Interdependencies:** Model skill loss or maybe no interdependencies within OPCs.
- **Critical Impact Point:** After 24 hours. Multiple AMV/FTW data feeds are received and processed daily, delay or lack of an individual does not constitute critical outage. However, extended interruption in delivery of multiple satellites impacts criticality
- **Mitigation Process:** Initiate/implement alternate delivery path
- **Communications Path:** OTN/NIPRNET/Internet
- **Initiation Timing:** After 24 hours, FNMOC will initiate/implement alternate delivery path
- **POCs:** FNMOC (Trent Hancock) and NAVO (Tracy Lepire)
- **Last Tested:** still in the planning and evaluation phase
- **Negatives of the Alternative:** Latency will be incurred in product delivery and monitoring/support is not 24x7 from U of W. (Likely more latency once the COPC network and other DREN/Internet are running through NFG and NIPRNet.)

COPC AI Recommendation

COPC Action Item 2016-1.1: Refine the OPC outage mitigation priority list, identify candidate data exchanges, and investigate mitigation approaches for the highest priority items at each OPC. (Additionally, add a column that calls out the negatives when using the alternative data solution and make the document for internal OPC use only.)

- CSAB should work to develop, document, and maintain the Outage Mitigation Strategies.
- CSAB will need to check with the COPC (OPCs) when resources are needed to develop or implement a new Outage Mitigation Strategy.
- Recommend closing this action.

Questions / Discussion