



SATELLITE OPERATIONS

Current Operational Satellite Update

Monday, June 2

Satellite Proving Ground/User Readiness

Kansas City, MO

Presented by **Natalia Donoho**

User Services Coordinator (NESDIS/OSPO)



Presentation Outline

- Introductions
- OSPO Overview
- Operational Satellite Status
 - GEO Status
 - GOES-13/14/15
 - LEO Status
 - METOP-A/B
 - NOAA-19
- Hot Topics
 - GOES-East transition to optimized schedules
 - Known Data Disruptions
- Upcoming Events & Meetings

Introduction (Matt & Nat)

User Services Team

LT Bill Winner and John Paquette are assisting



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NESDIS Office of Satellite and Product Operations (OSPO) Key Roles

Ground System Command & Control, Ingest, Product Generation and Distribution for the nation's **16** environmental satellites

- 3 Geostationary (GOES) by NOAA
 - 4 Polar-Orbiting (POES) by NOAA
 - 2 MetOp Polar-orbiting Joint EUMETSAT and NOAA
 - 5 Defense Meteorological Satellite Program (DMSP) operated by NOAA
 - 1 Jason-2 altimetry satellite - Joint NOAA, NASA, CNES, EUMETSAT effort
 - 1 Suomi National Polar-orbiting Partnership (S-NPP) by NOAA & NASA
-
- Preparing for upcoming launches
 - Himawari-8: September 2014
 - DSCOVR (Solar Wind continuity): January 2015
 - Jason-3 (Ocean Surface Topography): March 2015
 - GOES-R: Early 2016
 - COSMIC-2: 2016 (first six satellites)
 - JPSS-1: Early 2017

ESPC Access to Data & Products

GINI (GOES Ingest and NOAAPORT Interface)

McIDAS powered remapped satellite data distributed to NWS for display on AWIPS

Derived products (i.e. GOES/POES Sounding Products) generated external to GINI distributed via GINI

Available from NWS Broadcast and via McIDAS from select Unidata sites

ReBroadcast Services: GeoNETCAST, NOAAPORT

GVAR, LRIT, EMWIN, DCS, SARSAT

HRPT, VHF, APT, ARGOS

Internet Distribution (Web, FTP, ADDE)

www.ospo.noaa.gov (links to GIS, JPG, KMZ files)

Satepsanone.nesdis.noaa.gov (HTTP and FTP) – download binary files (AREA)

ADDE: PUB on satepsanone.nesdis.noaa.gov – public McIDAS

NOAA Operational Satellites

May 2014

	METOP-B	NOAA-19	S-NPP*	GOES-13	GOES-15
Launch Date	Sept 2012	Feb 2009	Oct 2011	May 2006	March 2010
Operational Date	April 2013	Jun 2009	Sept 2013 (NDE)	April 2010	December 2011
Mission Data Category	Primary (AM)	Secondary (PM)	Primary (PM)	GOES-East	GOES-West
Product Areas					
Imagery	G	G	G	G	G
Radiances	G	G	G (CrIS/ATMS)	G	G
RadBud/Emissivity	G	G	G	G	G
Soundings	G	G	G (CrIS/ATMS Moist and Temp Profiles)	G	G
Winds	G	G	G (VIIRS PW)	G	G
Sea Surface Temp	G	G	G (VIIRS SST)	G	G
Precipitation	G	G	G (MIRS RR+TPW)	G	G
Volcanic Ash	G	G	FY-15	G	G
Tropical Products	G	G	N/A	G	G
Ozone	G	G	G (OMPS Profile +TC Ozone BUFR)	N/A	N/A
Fire and Smoke	G	G	FY-15	G	G
Snow and Ice	G	G	FY-14 (VIIRS Sea Ice +Snow)	G	G
Vegetation	G	G	FY-14 (VIIRS Green Vegetation Fraction)	N/A	N/A
Broadcast Services	G	G	G	G	G

*NPP Products includes only those deemed operational since NDE handover Sept 26, 2013

Operational	G	Future S-NPP products	
Operational with Issues During Reporting Period	Y	Operational with Degradation	
Non-Operational	R	Not Applicable	N/A

Geostationary Operational Environmental Satellite (GOES) Operations Status

March 31, 2014

<i>Payload Instrument</i>	GOES-13 (East) Launch: May 06 Activation: Apr 10	GOES-15 (West) Launch: Mar 10 Activation: Dec 11
Imager	G	G
Sounder	Y (1)	Y (5)
Energetic Particle Sensor (EPS)	G	G
Magnetometers	G	G
High Energy Proton and Alpha Detector (HEPAD)	G	G
X-Ray Sensor (XRS)	R (2)	G
Solar X-Ray Imager (SXI)	Y (3)	S/C (6)
<i>Spacecraft Subsystems</i>		
Telemetry, Command & Control	G	G
Attitude and Orbit Control	G	G
Inclination Control	G	G
Propulsion	S/C (4)	G
Mechanisms	G	G
Electrical Power	G	G
Thermal Control	G	G
Communications Payloads	G	S/C (7)

Key
Operational
G Spacecraft issues but no user impacts
S/C Operational with limitations
Y
Non-operational
R

Backup NOAA Satellites

May 2014

	METOP-A	NOAA-18	NOAA-16	NOAA-15	GOES-14
Launch Date	Oct 2006	May 2005	Sep 2000	May 1998	June 2009
Operational Date	May 2007	Aug 2005	Mar 2001	Dec 1998	N/A
Mission Data Category	Secondary (AM)	Secondary (PM)	Secondary (PM)	Secondary (AM)	Storage / Space Weather
Product Areas					
Imagery	G	G	G	G	N/A
Radiances	G	Y	Y	Y	N/A
Radiation Budget/Emissivity	G	G	G	G	N/A
Soundings	G	Y	N/A	N/A	N/A
Winds	G	G	G	G	N/A
Sea Surface Temp	G	G	Y	Y	N/A
Precipitation	G	G	Y	Y	N/A
Volcanic Ash	G	G	G	G	N/A
Tropical Products	G	G	Y	G	N/A
Ozone	G	Y	Y	G	N/A
Fire and Smoke	G	G	G	G	N/A
Snow and Ice	G	G	G	G	N/A
Vegetation	G	G	G	Y	N/A
Broadcast Services	Y*1	G	G	G	N/A

1. *2Metop-A AHRPT does not support full global coverage due to earlier failure of part of the AHRPT system

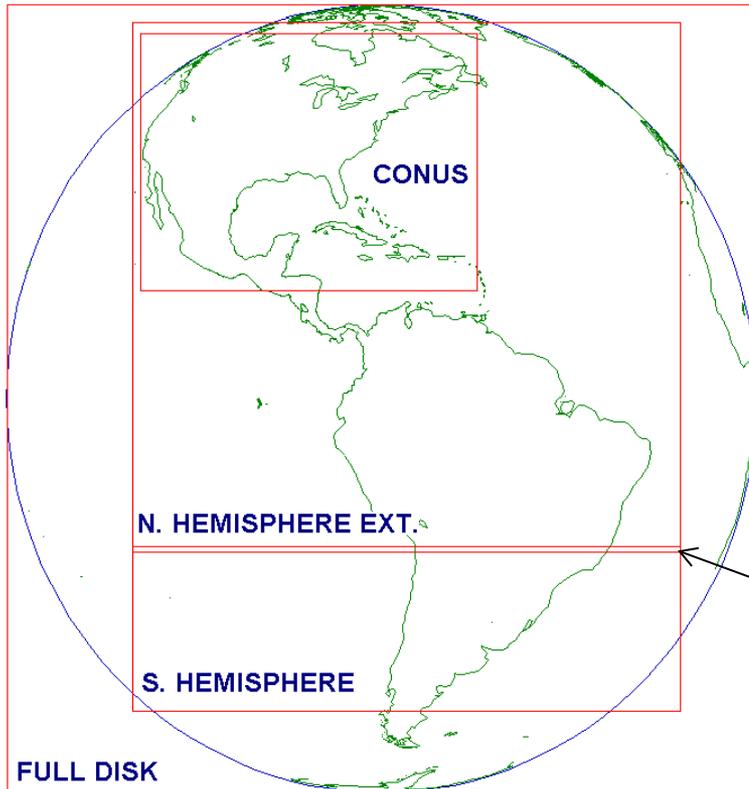
Operational	G		
Operational with Limitation	Y		
Non-Operational	R	Not Applicable	N/A

GOES-East Optimized Schedules

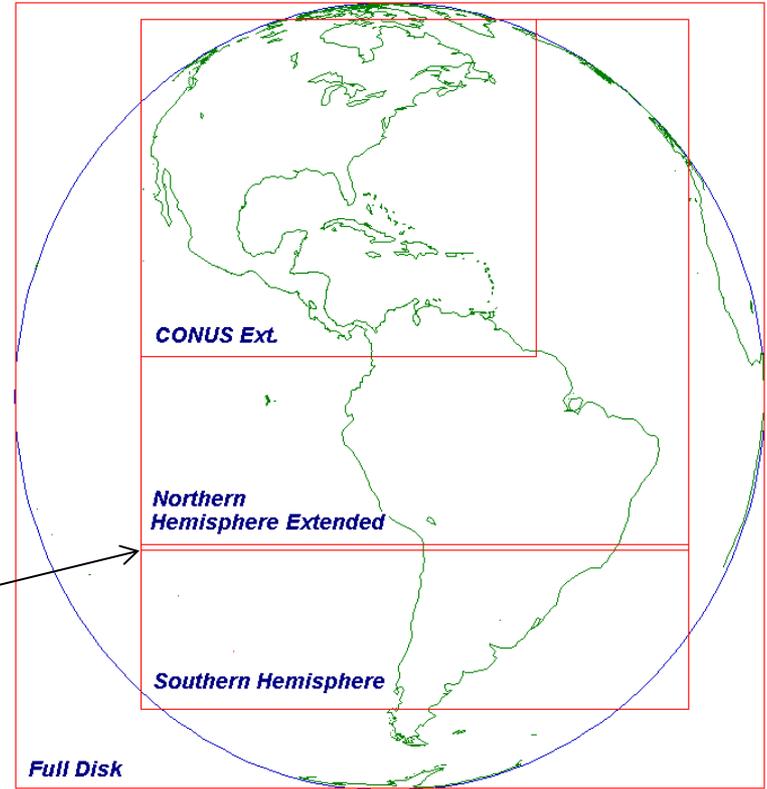
- Routine Schedule
 - The freed time will enable more coverage in areas, such as Canada, Western North Atlantic Ocean, the Caribbean Sea, Central America and South America.
 - For example, a tropical cyclone in the Eastern and Southern Caribbean Sea will now be imaged twice as often - every 15 minutes instead of every half hour.
- Rapid Schedule
 - Additional coverage of South America.
- Super Rapid Schedule
 - Gain 1 additional image per ½ hour.
 - Images are spread out more in time, giving better chance of more images in the time period of interest.
- Full Disk Schedule
 - Restores southern edge of Full Disk imagery.

GOES-East Routine Frame Changes

GOES East Current
Routine



Optimized



N. Hemisphere Ext.
& S. Hemisphere
frames overlap

The CONUS image in the Current Routine is replaced by the CONUS Ext. image in the Optimized Routine. This will gain beneficial coverage over more of Canada, West North Atlantic Ocean, the Caribbean Sea, East Caribbean Islands, Nicaragua, Costa Rica, Panama, Columbia, Venezuela, and Guyana. (No other frames change)



Known Data Disruptions

- **GOES-15 antenna issue at NSOF** – October 20, 2013 @ 0400 UTC- 0705
- **ESPC Failover to Wallops CIP GINI** – December 10, 2013 @1100 UTC
 - NWS did not have GOES imagery feed for approximately a 4 hour period
 - Cause: CIP can only send data to BNCF. They don't have the T1 line needed to send to ANCF
- **GOES-13 Imagery degradation and GINI Switch** – February 13, 2014 @1422-1515 UTC
- **FOS data outage** – March 9-10, 2014
- **GOES-East Imagery Loss** – April 7, 2014 @ 2025-2245 UTC
 - Multiple GOES Ingest NOAAPORT Interface (GINI) issues, to include system and application problems, resulted in a lack of data availability and failed processing
- **CIP Failover** – May 28, 2014

Suomi-NPP Status

as of April 24, 2014

Spacecraft	S-NPP
Launch Date	Oct 28, 2011
Mission Category	LTAN 1330 (PM) +/- 10 mins

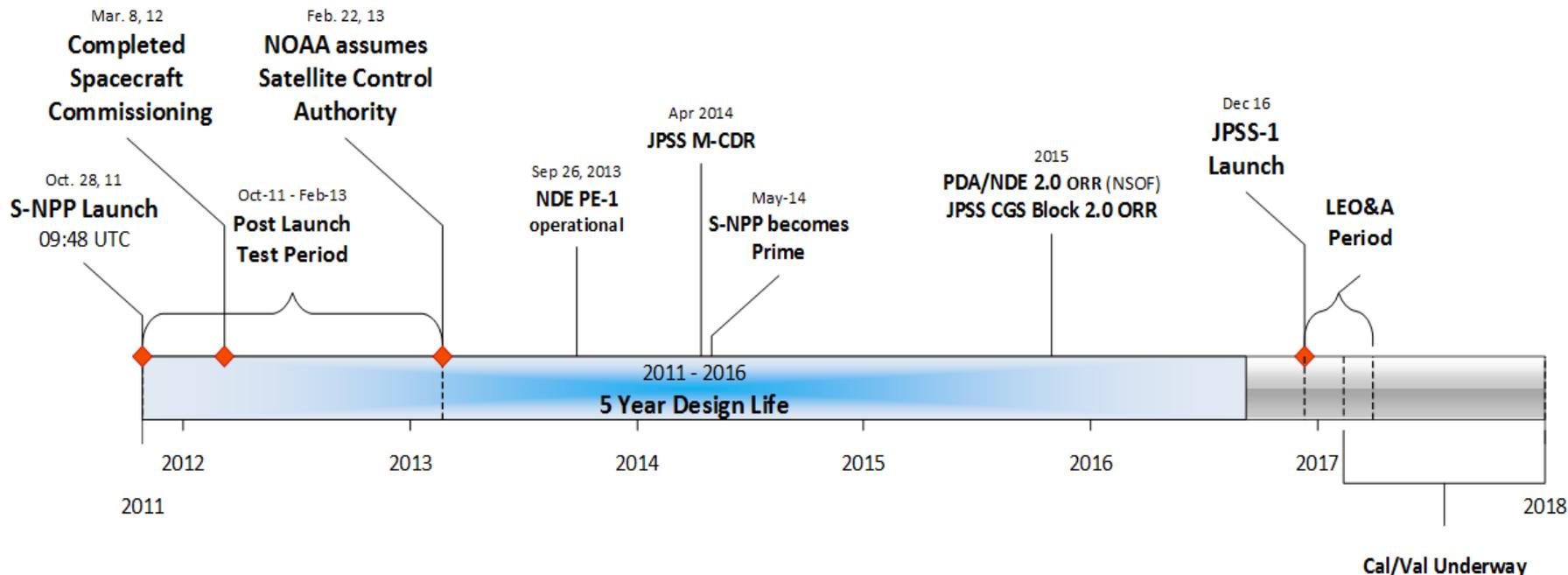


Payload Instruments	Status
ATMS	G
CERES	G
CrIS	G
OMPS – Nadir	G
OMPS – Limb	G
VIIRS	G

-  Operational (or capable of)
-  Operational with limitations (or in standby)
-  Operational with degraded performance
-  Not functional

Spacecraft Subsystem	Status
TLM, Command & Control	G
ADCS	G
EPS	G
Thermal Control	G
Communications	G
CDP	G
SCC	G
GPS	G
1553	G
1394	G

-  Functional but turned off
-  No status reported



- NUCAPS T/q profiles available on the SBN as of April 15, 2014.
 - details noted in TIN 14-03: <http://www.nws.noaa.gov/os/notification/tin14-03nucaps.txt>
- JPSS-1 Mission Critical Design Review conducted on April 22-24, 2014 and that new mission is currently on-track for launch in Dec of 2016.
- S-NPP became primary satellite in PM orbit on May 1st, 2014; this is a designation on the mission management control side for resource priority usage – NOAA-19 data will still be made available.

Suomi-NPP Maneuvers

Long lead time scheduled maneuvers:

- Drag Make-Up maneuver (DMU) for maintaining optimum geo-location.
- VIIRS Lunar Roll (~9 per year) for VIIRS calibration activities
- Inclination Maneuvers to ensure optimum LTAN maintenance – 1st is anticipated by the summer of 2014.

Notification process: calendar summary via email, mission notices & ESPC notices

Short lead time maneuvers:

- Risk Mitigation Maneuver (RMM) – risk analysis provided by NASA CARA.

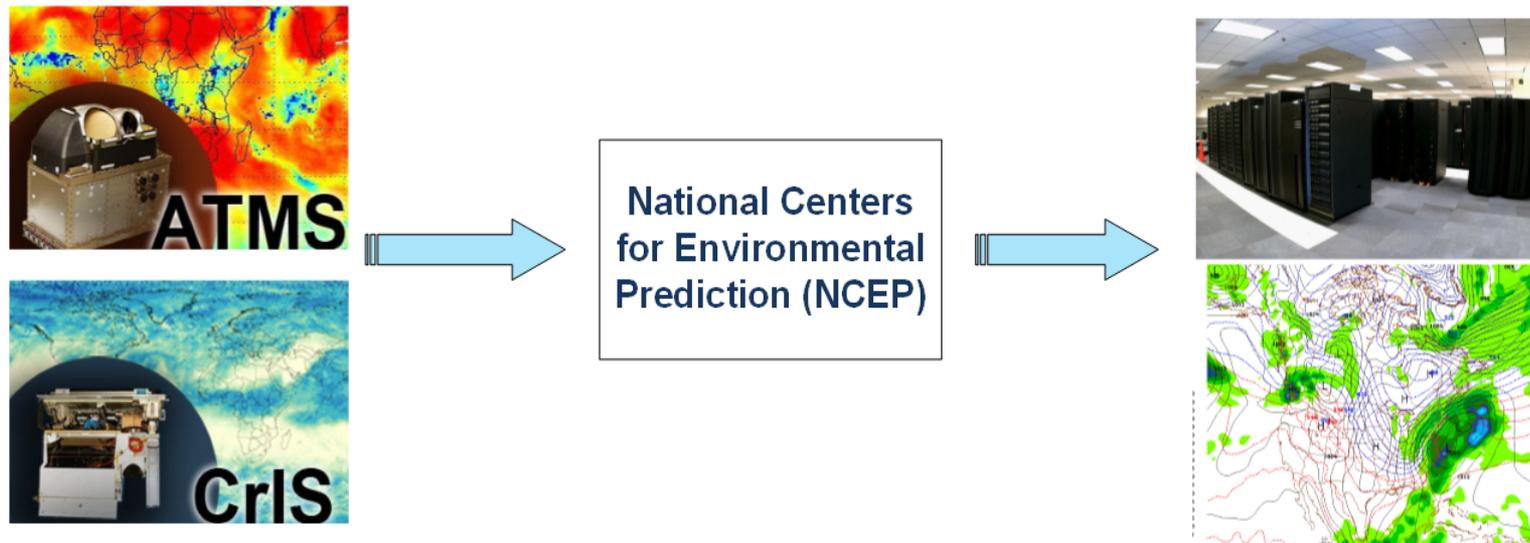
Notification process: mission notices & ESPC notices

S-NPP Key Performance Parameters (KPPs)

VIIRS Imagery EDR - 0.64 μm (I01), 3.74 μm (I04), 11.45 μm (I05), 8.55 μm (M14), 10.763 μm (M15), and 12.03 μm (M16) for latitudes greater than 60°N in the Alaskan region



CrIS & ATMS SDRs – for data assimilation into numerical weather prediction (NWP) models



S-NPP is NASA satellite operated by NOAA

- Serving as a Risk Reduction Mission and Operational Mission

Anomalies

- CrIS CREECBIT stuck
- Half Angle Mirror (HAM) and Rotating Telescope Assembly (RTA) occasionally loses sync
- VIIRS Single Board Computer (SBC) Lock-Ups
- 1394 bus reset
- CEP-1
- ATMS Scan Motor increase

Suomi-NPP and JPSS-1

S-NPP prime ground station is SVL (located in Svalbard, Norway)

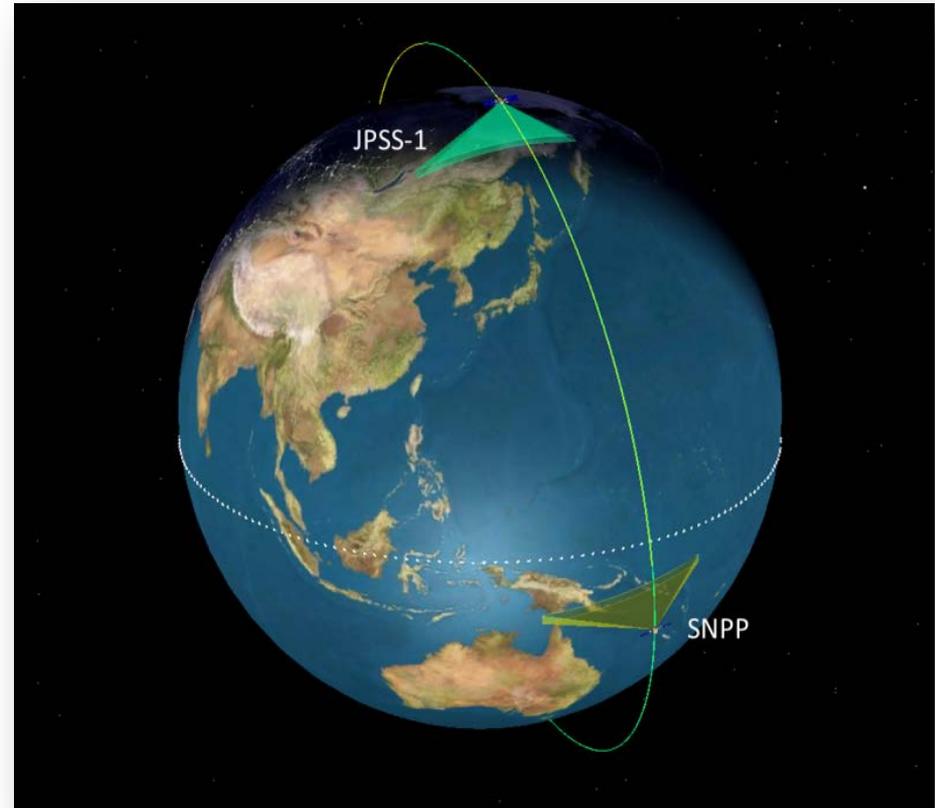
- SSR dump every orbit (101 mins)
- TDRSS (White Sands) support is available for anomaly resolution and proficiency passes

JPSS-1 prime ground stations are SVL and McMurdo (located in Antarctica)

- SSR dumps twice per orbit, one complete rev down linked each dump (1/2 orbit overlap)
- Ka-band SMD also available for J-1 via TDRSS as contingency
- TDRSS (White Sands) support is available for LEO&A, anomaly resolution, SMD and proficiency passes

Backup ground station sites are:

- Fairbanks CDAS
- Troll



JPSS-1 will assume 1330 LTAN (PM)
Orbit

S-NPP will be 20 minutes behind JPSS-1

Upcoming Events and Meetings

- **July 13-18, 2014:** The International Geoscience and Remote Sensing Symposium, Québec, Canada
- **July 30 – Aug 1, 2014:** The 27th Satellites and Education Conference, Madison, WI.
- **September 22 - 26, 2014** 2014 EUMETSAT Meteorological Satellite Conference, Geneva, Switzerland
- **January 4-8, 2015** AMS Annual Meeting, Phoenix, AZ
- **April 27 – May 1, 2015** NOAA Satellite Conference, Greenbelt Marriott Hotel, Greenbelt, MD

Questions/Comments

- Open for any questions or comments...

Backup/Hidden Slides