



GOES R

GOES-18 Transition to Operations

GOES-R Steering Group

September 23, 2021



NOAA ~ NASA





GOES-West Transition Plan for (Swap of GOES-17/18)

- Transition plan swaps GOES-17 with GOES-18 as the operational GOES West satellite
 - Assumes successful launch and checkout of GOES-T/18
- Incorporates early drift of GOES-18 to the West operational longitude
 - Allows for early operational use of GOES-18 ABI after Beta maturity is achieved
 - Transition plan incorporates RF conflict mitigation between GOES-17/18 X-band and T&C uplinks/downlinks
 - Users do not need to re-point antennas
- GOES-18 will be drifted to 136.8W to complete instrument PLT activities
 - 0.4 deg offset from GOES-17 allows X-band RDL downlink from both G17/G18
 - 0.2 deg offset from 137.0W meets ground product generation requirements
 - Both GOES-17 and GOES-18 images will be re-mapped to 137.0W
- GOES-18 ABI data available to support August GOES-17 ABI warm period
 - GOES-18 ABI data available via Cloud interface and interleaving with GOES-17 non-ABI product data
- After operational transition, GOES-18 is nudged over to 137.2W
- GOES-17 drifted to 105W and placed in on-orbit storage



Revised PLT Plan – Schedule Overview

Feb. 16, 2022 Launch

- **Launch on February 16, 2022**
- **LOR: 2/16/22 – 3/10/22**
 - Orbit Raising plan unchanged; Geo insertion at 89.5W
- **PLT Part 1: 3/14/22 – 4/29/22**
 - Instrument outgassing
 - GN&C and COMM PLT
 - Some early instrument PLT activities at 89.5W (e.g. Door open, mechanism checkout, first ABI images)
- **Drift to 136.8W: 4/29/22 – 5/23/22**
 - GOES-18 instruments remain ON
 - PLT activities paused; No product data
- **PLT Part 2: 5/23/22 – 9/16/22**
- **ABI Beta Maturity: 7/8/22**
 - ABI PLT Complete
 - PLPT Continues
- **GOES-18 ABI data available during GOES-17 ABI warm period (August 2022)**
- **GOES-18 will transition to GOES West operation at 137.2°W once products reach provisional maturity (~Dec 2022)**
 - GOES-17 moved to storage location (105W)

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GOES-West Transition Plan - Swap of GOES-17/18 Based on 2/16/22 Launch Date

Date (Based on 2/16/22 Launch)	GOES-17		GOES-T/18	
	Location	Activity	Location	Activity
2/16 – 3/10	137.2°W	GOES-West Operations		Launch and Orbit Raising
3/14 – 4/29			89.5°W	GOES-18 PLT Part 1 • Instrument Outgassing, Spacecraft PLT • First ABI Image (Vis & IR) @ 89.5W
4/29 – 5/23			Drift to 136.8W	GOES-18 Drift from 89.5W to 136.8W • PLT activities paused; No GOES-18 product data
5/23			136.8°W	GOES-18 PLT Part 2 begins
7/8			136.8°W	GOES-18 ABI reaches Beta maturity • GOES-18 ABI 'supplemental' data via Cloud
8/1-9/6	137.2°W	GOES-17 ABI Warm Period • G-18 ABI interleaved in G-17 data	136.8°W	GOES-18 ABI data interleaved in GOES-17 data
9/6-11/16	137.2°W	GOES-West Operations • GOES-17 Nominal Distribution	136.8°W	GOES-18 product maturation continues • GOES-18 ABI 'supplemental' data via Cloud
9/16	137.2°W	GOES-West Operations • GOES-17 Nominal Distribution	136.8°W	GOES-18 PLT Part 2 Complete (9/16) • NASA Post Launch Assessment Review (9/14) • Handover Readiness Review (9/21) • GOES-18 Handover to OSPO (9/21)
Est. 12/12	137.2°W	Full G-18 GRB relayed through G-17 • Users do not need to re-point antennas	136.8°W	GOES-18 Declared operational GOES-West • Ops Transition Readiness Review held 1 week prior • Begin full G-18 GRB broadcast (relay through G-17)
12/13 – 12/20		Full G-18 GRB relayed through G-17 during longitude shift	Slow drift to 137.2°W	GOES-18 gradual shift to 137.2
12/21	Drift to 105°W	GOES-17 Instruments deactivated GOES-17 drift to 105°W followed by storage mode	137.2°W	GOES-18 Nominal Distribution • End G-18 GRB relay through G-17



GOES-17/18 Transfer of Operational Designation

Date (Based on 2/16/22 Launch)	GOES-17		GOES-T/18	
	Location	Activity	Location	Activity
T-1w	GOES-17/18 Operations Transition Readiness Review Conducted by OSPO			
T-0	137.2°W	<ul style="list-style-type: none"> • End GOES-17 Imaging Operations and data distribution • Begin GOES-17 relay of GOES-18 GRB/HRIT • Users do not need to repoint antennas • GOES-17 X-band downlink turned off • GOES-17 Instruments shut down 	136.8°W	GOES-18 Operational Designation <ul style="list-style-type: none"> • Begin relay of GOES-18 GRB/HRIT through GOES-17
T+1d	137.2°W	No Change	136.8°W	GOES-18 gradual shift to 137.2W <ul style="list-style-type: none"> • GOES-18 Product Operations Continue • GOES-18 data is relayed through GOES-17
T+7d	137.2°W	End GOES-18 data relay through GOES-17 Begin GOES-17 Drift to storage longitude (105W)	137.2°W	GOES-18 shift to 137.2W Complete <ul style="list-style-type: none"> • End G-18 data relay through G-17 • Begin G-18 GRB broadcast / nominal distribution • SAR/DCS services transitioned to G-18

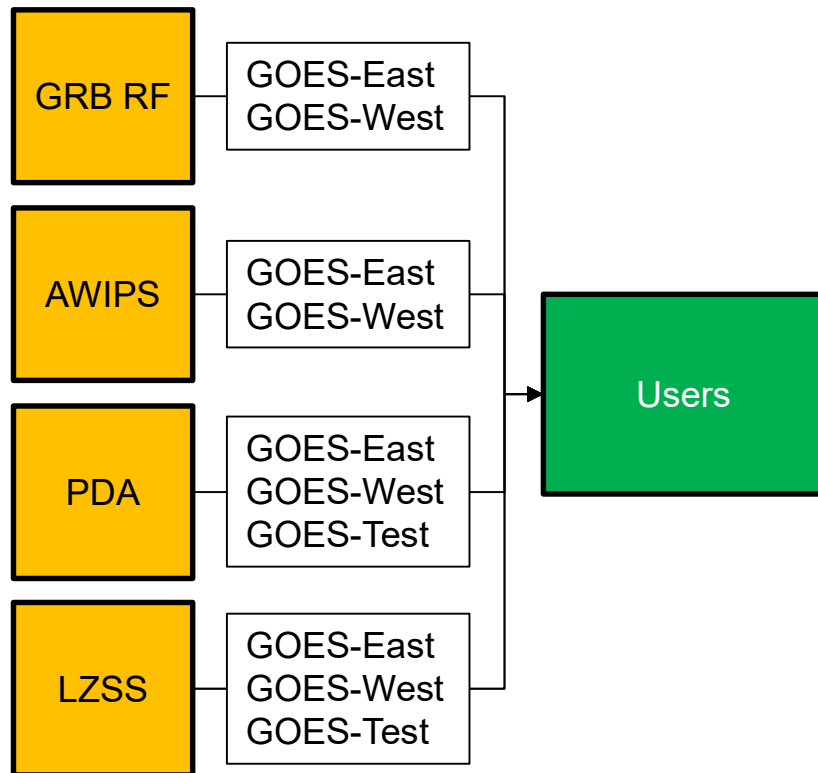
- GOES-18/West operational data will be relayed through GOES-17 until GOES-18 arrives at 137.2W
 - Users do not need to re-point antennas
- GOES-West data will be uninterrupted through the transition



Product Data Interleaving Background

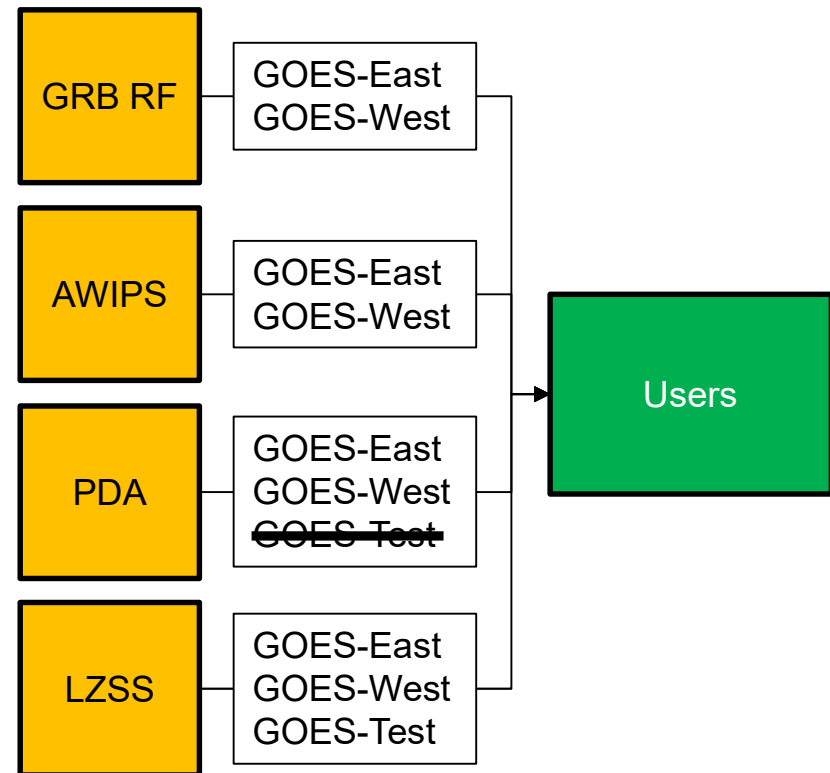
- NWS requested that the GOES-R Program distribute beta GOES-T ABI products during August 2022 warm season
- Multiple data distribution challenges had to be resolved to allow operational distribution of GOES-T products while GOES-17 is still officially GOES-West
 - When both GOES-T and GOES-17 are co-located near the GOES-W slot only one satellite can broadcast GRB due to signal interference
 - NWS AWIPS only has the capacity to receive data directly from the GS from two satellites simultaneously
- Interleaving is a method that allows the GOES-R GS to merge data from multiple satellites into a single data processing flow
 - Data to AWIPS and GRB uplink can be configured to contain a mixture of data from GOES-17 and/or GOES-T/18
 - Will present to the end user as a single GOES-West stream
- When interleaving all product metadata will be maintained so the original source spacecraft designator will remain intact
 - Users will always be able to determine which satellite was used to generate the data being reviewed

Nominal PLT (at WCDAS)



Stream	ABI Source	Other Inst Source
GOES-East	GOES-16	GOES-16
GOES-West	GOES-17	GOES-17
GOES-Test	GOES-18	GOES-18

Failover PLT (at CBU)



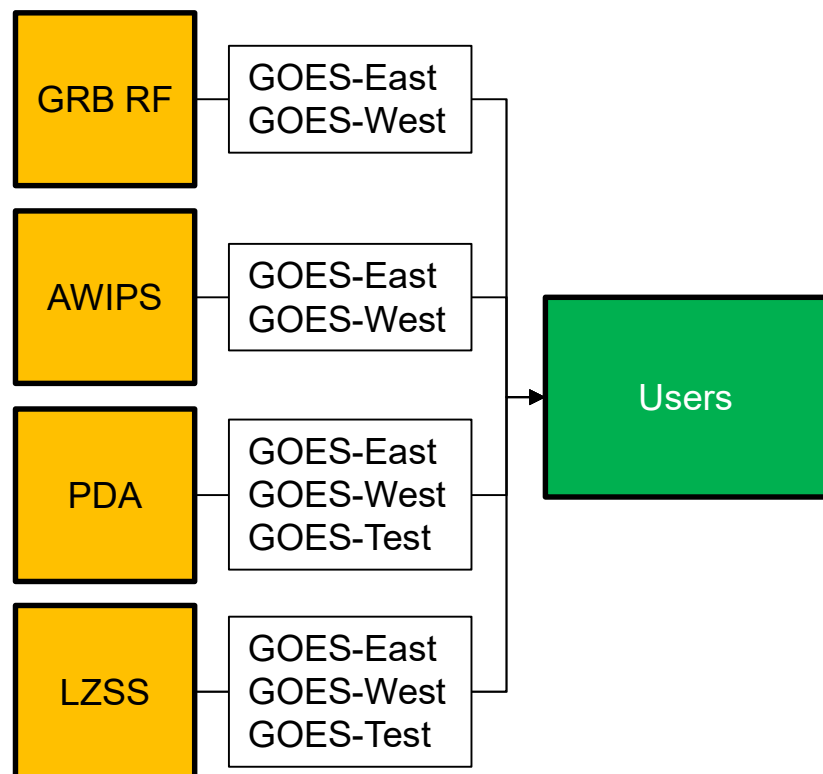
Stream	ABI Source	Other Inst Source
GOES-East	GOES-16	GOES-16
GOES-West	GOES-17	GOES-17
GOES-Test	GOES-18	L0 only GOES-18 L0 only

- CBU has only two DO strings, so GOES-18 L1b data will not be generated.

Level zero data from all 3 spacecraft will be stored in LZSS

Nominal PLT (at WCDAS)

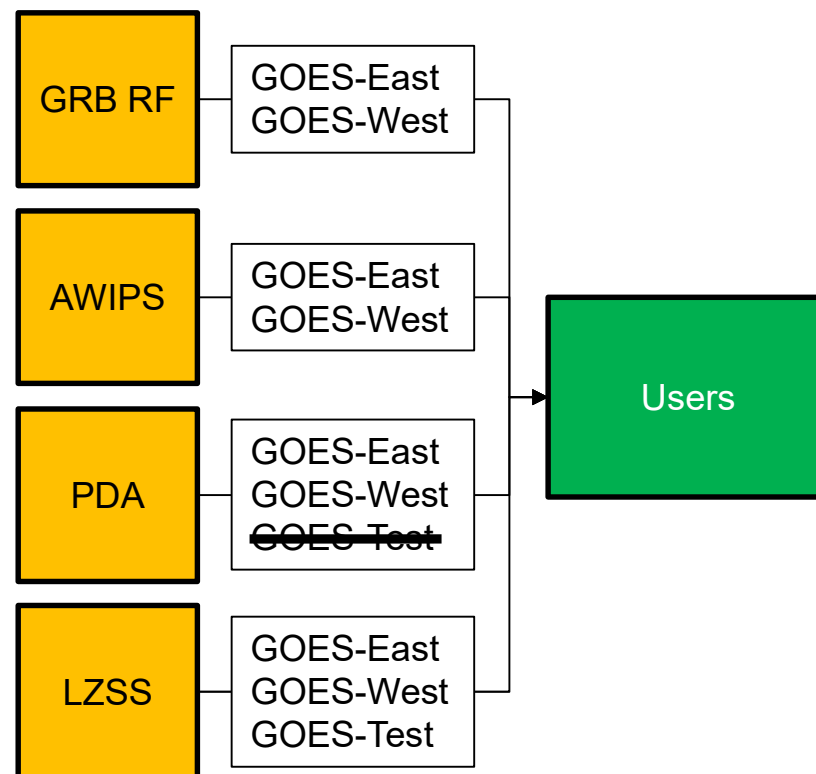
Nominal Interleave (at WCDAS)



Stream	ABI Source	Other Inst Source
GOES-East	GOES-16	GOES-16
GOES-West	GOES-17 ↻ -18	GOES-17
GOES-Test	GOES-18 ↻ -17	GOES-18

Failover PLT (at CBU)

Failover Interleave (at CBU)



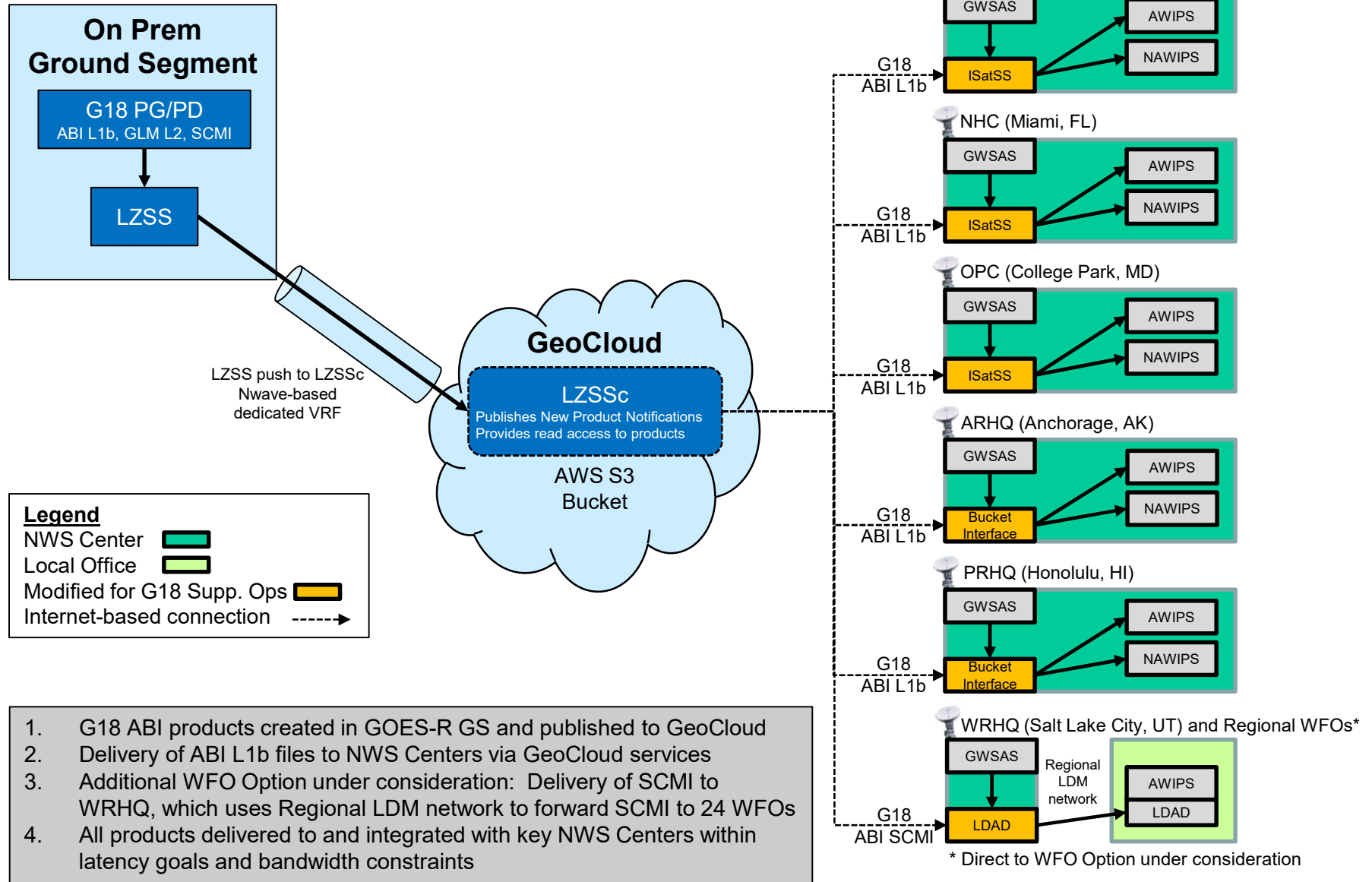
Stream	ABI Source	Other Inst Source
GOES-East	GOES-16	GOES-16
GOES-West	GOES-17 ↻ -18	GOES-17
GOES-Test	GOES-18 ↻ -17 L0 only	GOES-18 L0 only

- CBU has only two DO strings, so GOES-18 L1b data will not be generated.
- CBU has only two DO strings, so GOES-18 Non-ABI and GOES-17 ABI L1b/L2+ data will not be generated. L0 will still be generated.

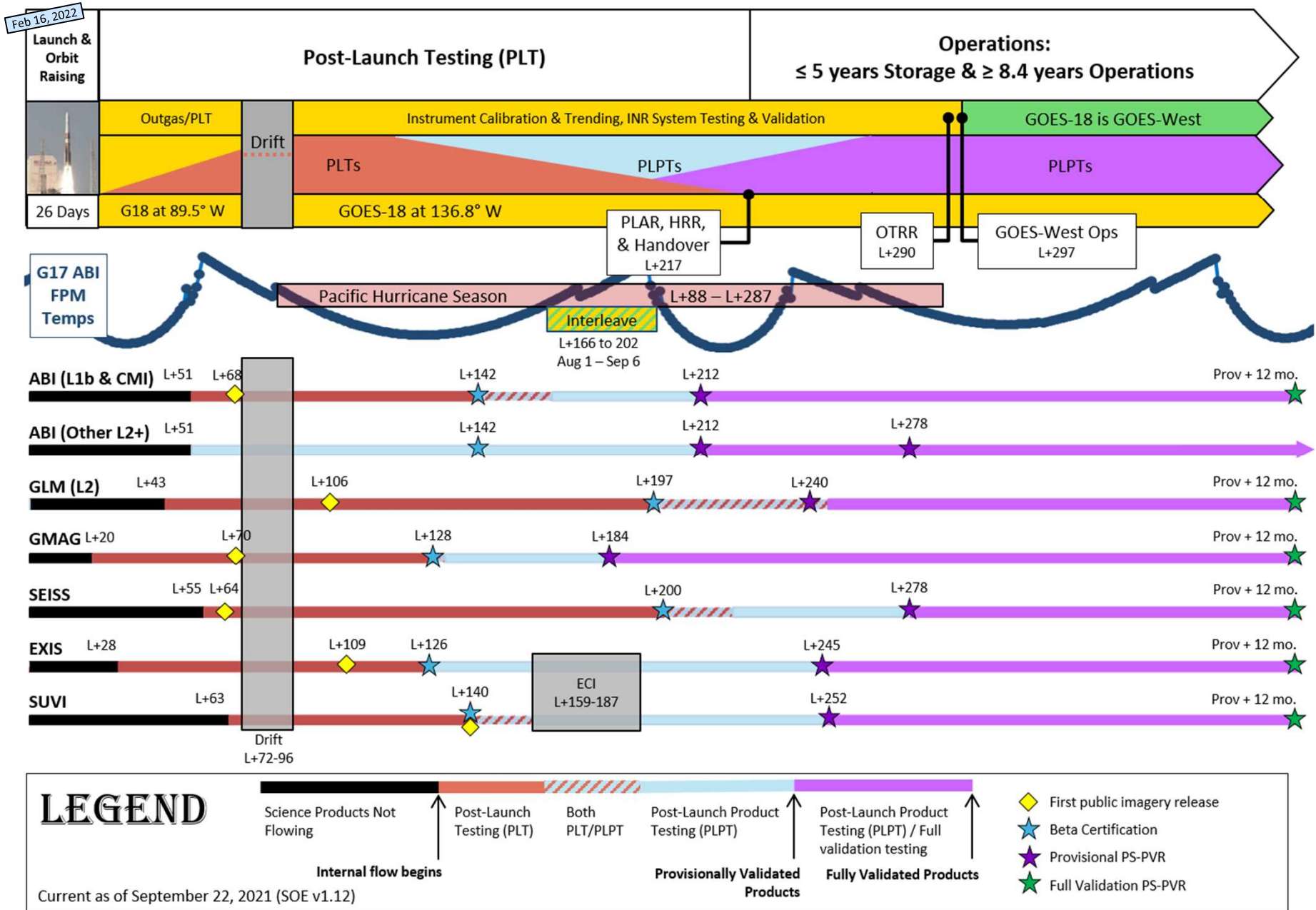
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GOES-T PLT Supplemental Cloud Data Flow to NWS

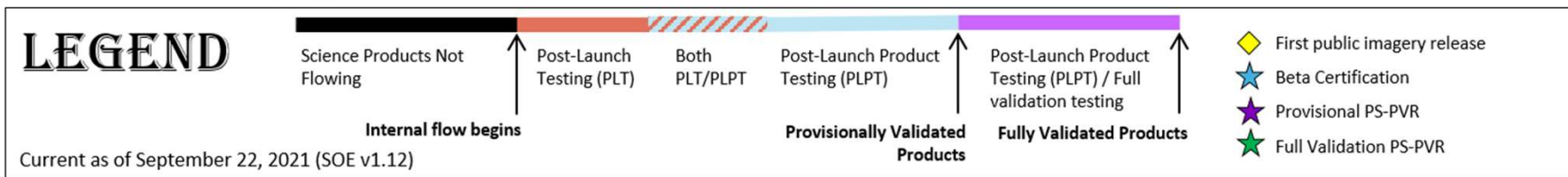
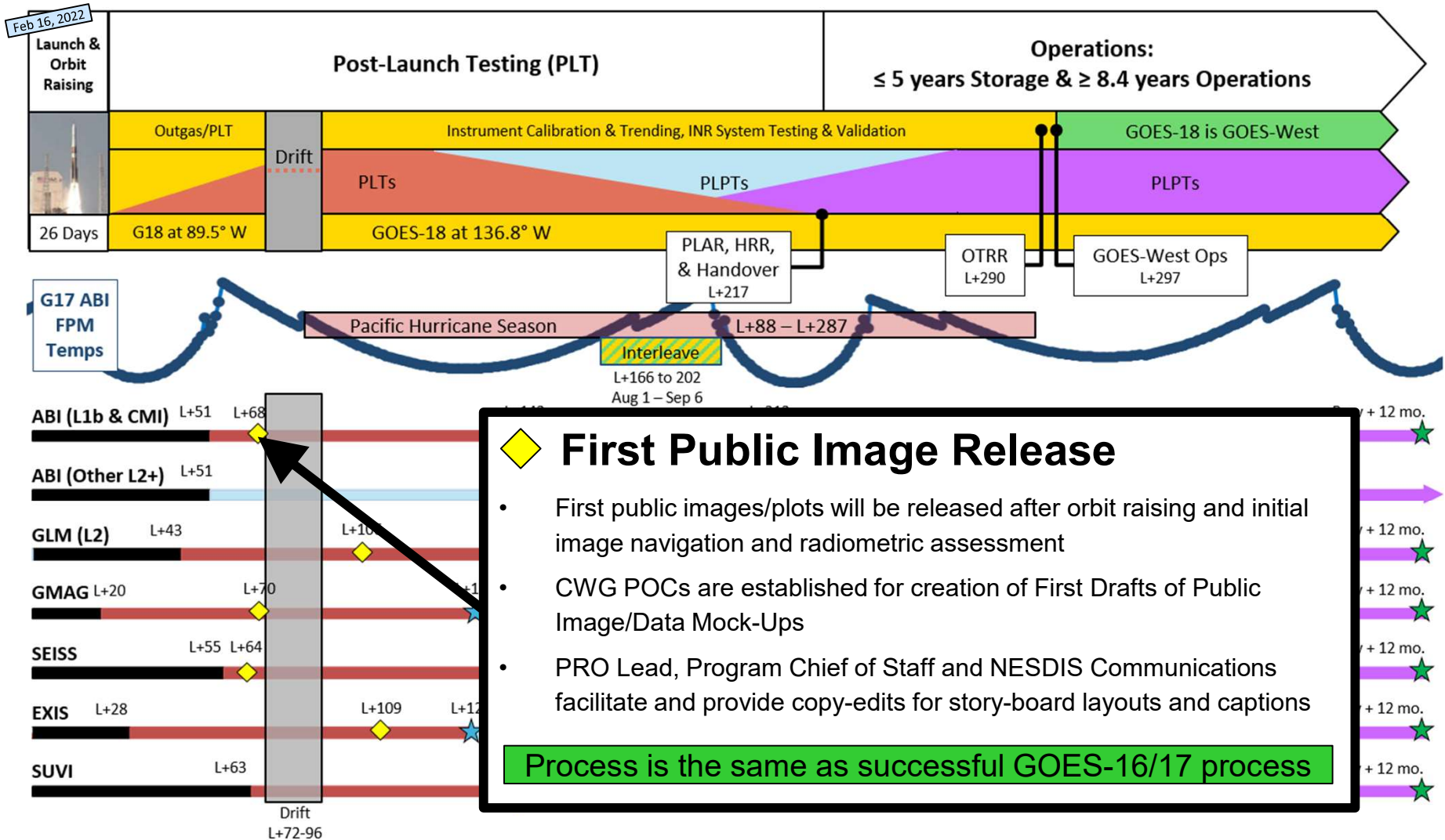


GOES-T Post-Launch Science Product Validation Schedule



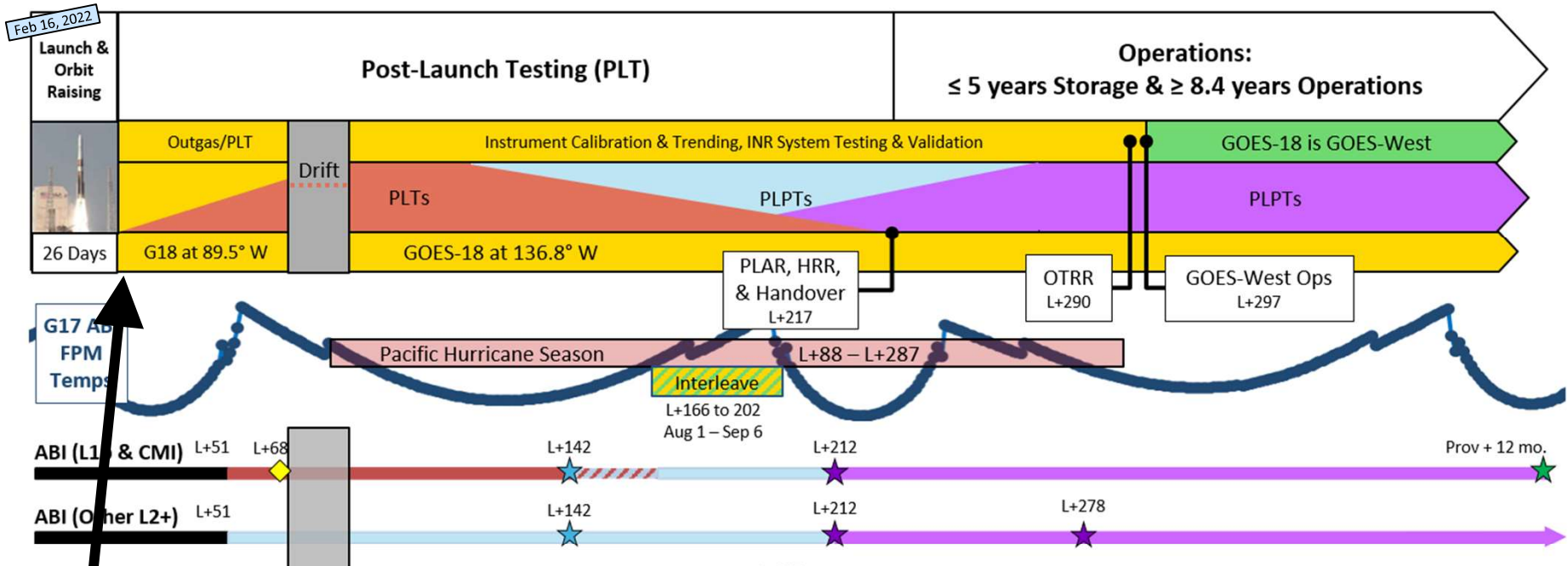
Note: All dates are coordinated with Flight/MOST PLT SOE group and are subject to change.

GOES-T Post-Launch Science Product Validation Schedule



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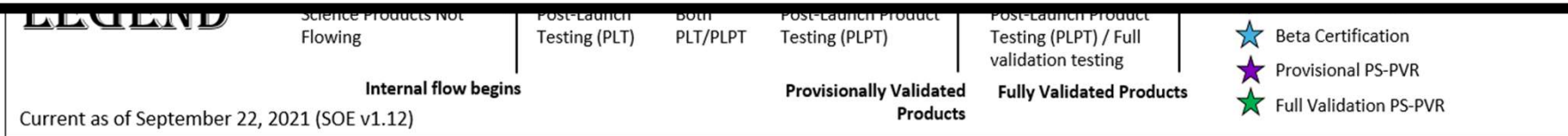
GOES-T Post-Launch Science Product Validation Schedule



Data Release Strategy: Internal Flow

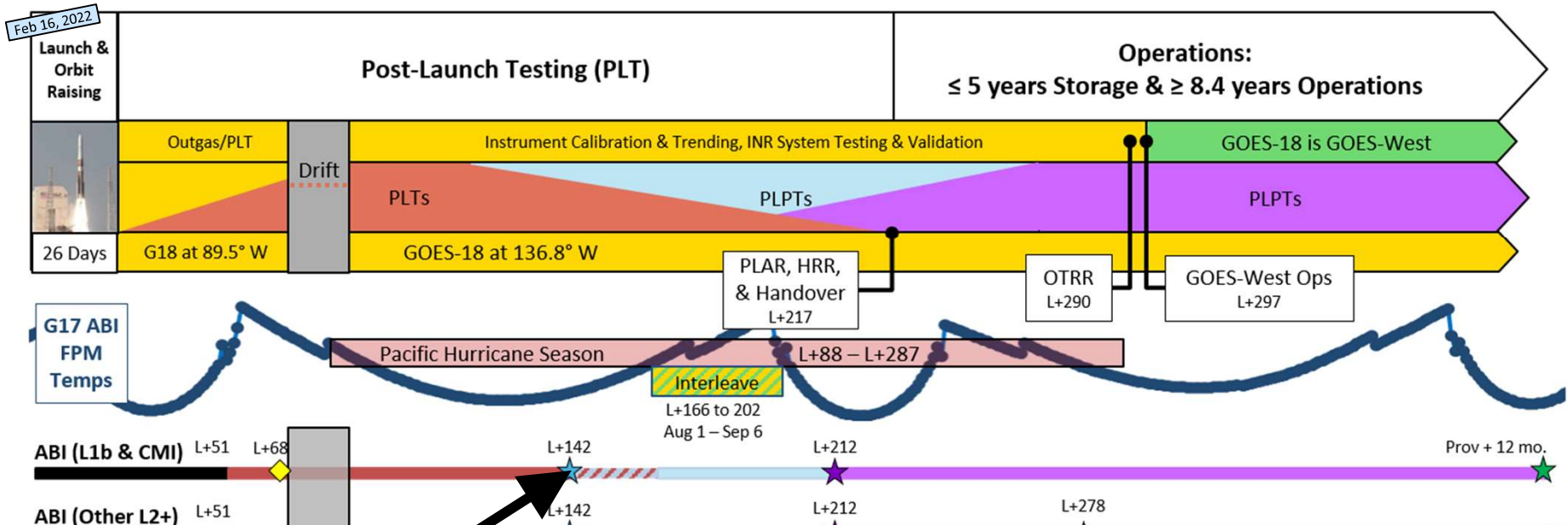
- Commences upon completion of each instrument's outgassing
- Data will flow for path integrity test purposes to PDA and AWIPS
- Data will flow for instrument vendor and CWG Cal/Val purposes to LZSS
- Data will not be released from LZSS, PDA, AWIPS (SBN) to any downstream consumers other than instrument vendors, CWG, and CLASS. The Unique Payload Services (GRB, HRIT/EMWIN, DCS) will also not yet distribute data.

Process is the same as successful GOES-16/17 process




Note: All dates are coordinated with Flight/MOST PLT SOE group and are subject to change.

GOES-T Post-Launch Science Product Validation Schedule



Data Release Strategy: Beginning of External Flow

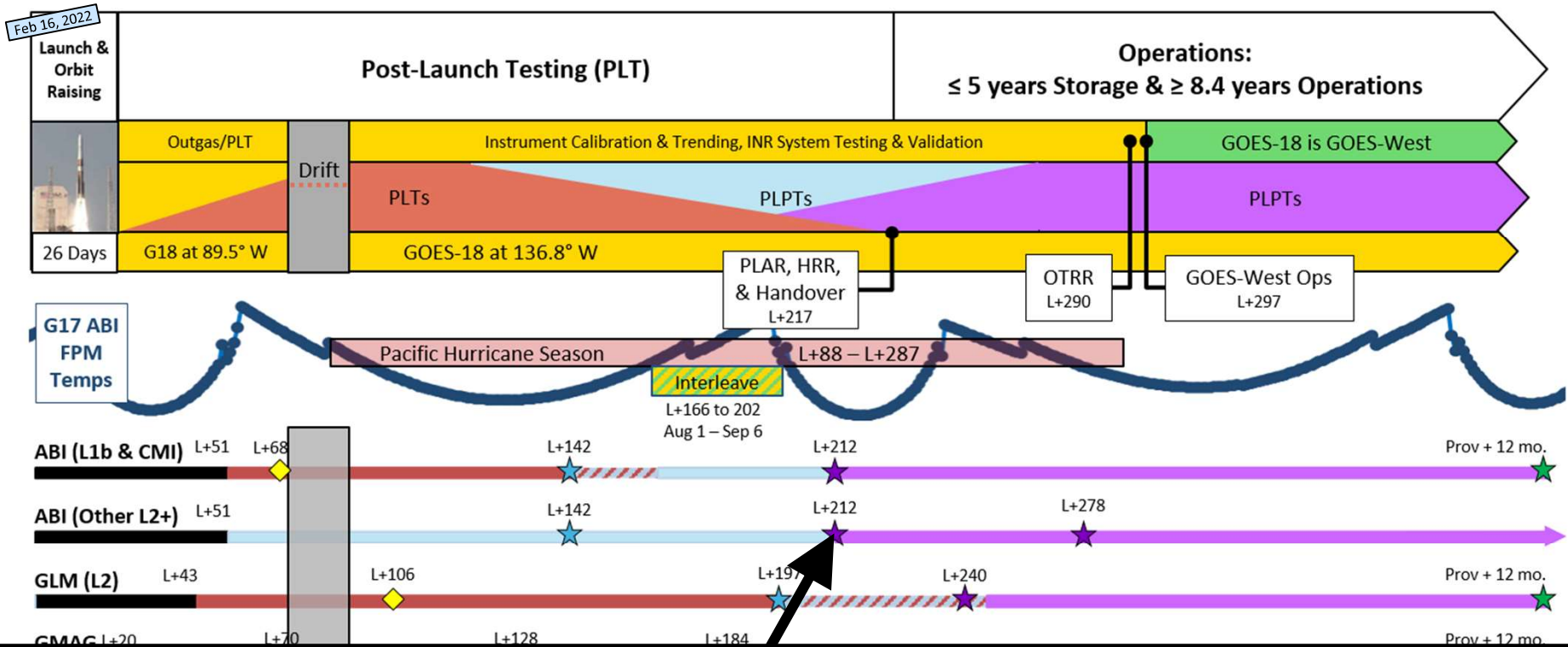
- Commences by product at Beta Maturity  which will not trigger GRB release like GOES-16/17
- LZSS, PDA, AWIPS (SBN) will flow data to their respective, integrated, downstream cal/val and I&T consumers
- PDA will not yet serve non-cal/val and non-I&T subscription holders
- Unique Payload Service Distribution [[GRB](#), HRIT/EMWIN and GNC-A] will not yet distribute GOES-T
- Interleave starts when G17 ABI warm period begins + G18 ABI L1b & SCMI are Beta + G18 ABI is out of PLT test modes
 - GOES-17 GRB RF will omit GOES-17 ABI L1b and add GOES-18 ABI L1b

Process is similar to successful GOES-16/17 process.
Changes for GOES-T appear in blue.

Current as of September 22, 2021 (SOE v1.12)

Note: All dates are coordinated with Flight/MOST PLT SOE group and are subject to change.

GOES-T Post-Launch Science Product Validation Schedule



Data Release Strategy: Completion of External Flow

- Commences by product at Provisional Maturity ★
- All subscriptions open to LZSS, PDA, AWIPS (SBN)
- Distribution on for Unique Payload Service Distribution [HRIT/EMWIN and GNC-A]. [GRB on at GOES-West declaration.](#)

Process is similar to successful GOES-16/17 process.
Changes for GOES-T appear in blue.

Internal flow begins | Provisionally Validated Products | Fully Validated Products | Validation testing

Current as of September 22, 2021 (SOE v1.12)

★ Provisional PS-PVR
★ Full Validation PS-PVR

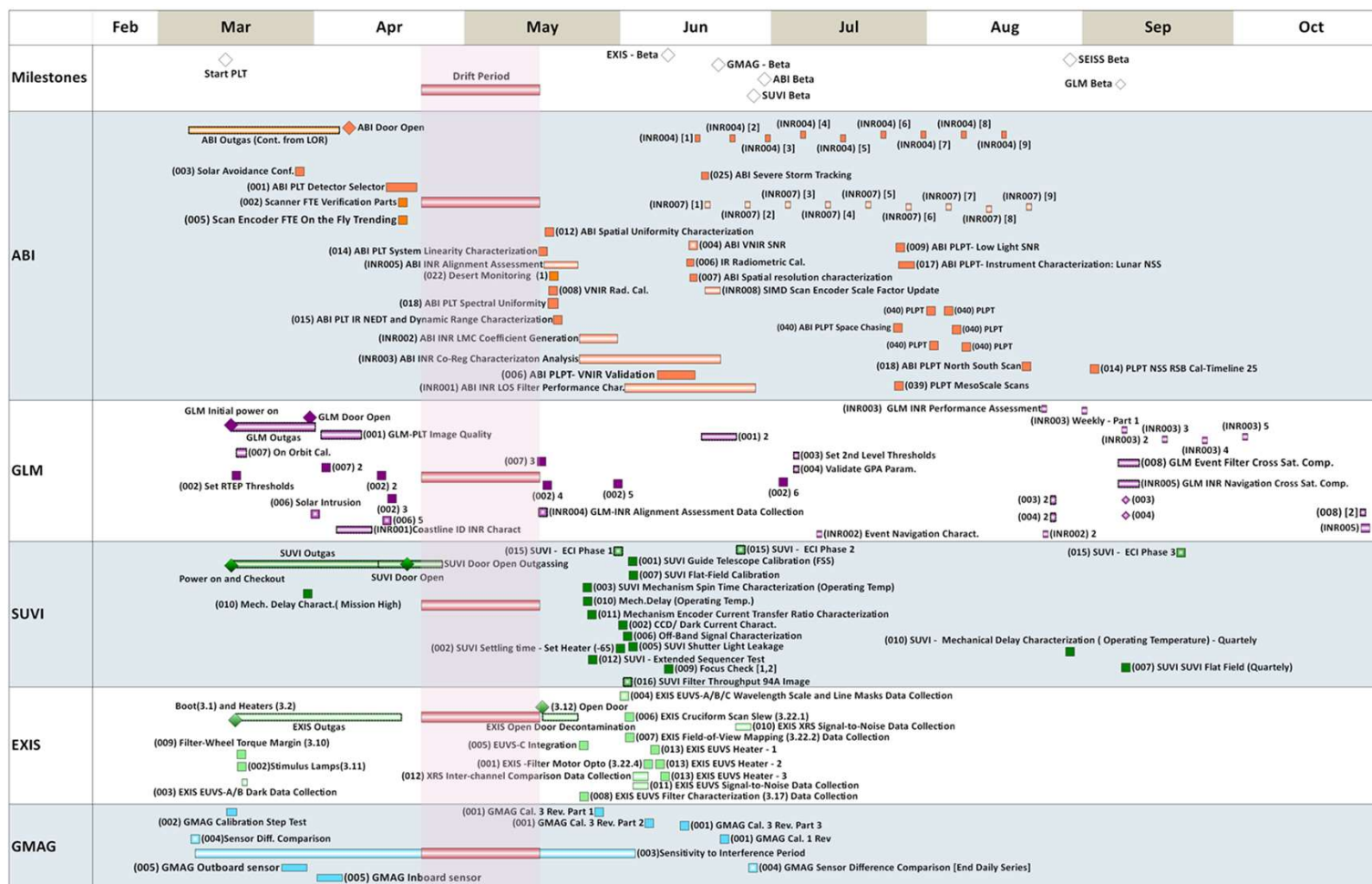
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BACKUP



Overview of PLT SOE : Launch 02/16/22 w/ Drift to 136.8W





Overview of PLT SOE : Launch 02/16/22 w/ Drift to 136.8W

