NWA Specialized Operations Committee - *IDSS Success Stories*

GOES-16 Enhancements to IDSS for

San Francisco International Airport (SFO) on 03/03/17

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San Francisco International Airport (SFO) is located on the northern end of a peninsula, surrounded by the cooler waters of the Pacific Ocean and San Francisco Bay. The cooler waters frequently support the development of marine stratus and fog that can significantly impact air traffic operations at SFO.

On a Visual Flight Rules (VFR) day the airport handles around 1200-1300 arrivals and departures, while on an Instrument Flight Rules (IFR) day, the numbers can be significantly lower. The days with lower operation numbers translates into travel delays, with monetary losses which can exceed one million dollars per day.

On March 3, 2017 the morning started out with clear skies and light winds around SFO. Around 14Z patches of stratus started to form south of SFO with the area growing to cover the approach to the airport by 16Z. IFR conditions prompted the start of a three hour Ground Delay Program (GDP) for the morning arrivals. Clearing was forecast to occur between 19Z-20Z.

 The GDP captured 48 flights with an average delay of 38 minutes, yielding a total of 1,824 delay minutes. Industry cost (per Airlines for America – A4A) per minute of delay is $81.00/min, which resulted in potential losses totaling about $150,000.

As with every stratus event, NWS Aviation Weather Center National Aviation Meteorologists (NAM) at the Air Traffic Control System Control Center (ATCSCC) and NWS Center Weather Service Unit (CWSU) Meteorologists at the Air Route Traffic Control Center (ARTCC) constantly monitor satellite pictures, observations, upper air data and hourly model output to refine the timing for clearing at SFO. Every earlier minute of clearing is crucial to the operations, especially during peak air traffic time frames.

GOES-W and GOES-16 imagery were both available to the NAM on this day. GOES-16 updates occurred every 5 minutes versus GOES-W every 15 minutes.

The higher frequency of GOES-16 data helped the NAM to determine that the edges of the patch of stratus were eroding much faster than was evident via GOES-W. This allowed the NAM to impart a high confidence forecast of earlier clearing to the FAA partners within ATCSCC, in collaboration with the CWSU meteorologist in Oakland. This in turn allowed the GDP to be cancelled early, which saved the airlines and traveling customers time and money.

The more frequent and higher resolution data from GOES-16 enabled meteorologists embedded in the ATCSCC to correctly support cancellation of the GDP about one hour earlier than what had been done in

the past with GOES-W. For this case, the cost savings to the airlines and customers totaled around $50,000.

IDSS @ SFO using GOES-16
(03/03/17)

1. 1600Z - Patch of Stratus formed over SFO & SMB necessitating a Ground Delay Program 1700z-1959z
2. 1700Z – GOES-16 loop shows edges starting to erode
3. 1715Z – GOES-W loop shows edges starting to erode
4. 1719Z – NAM Coordinates with CWSU ZOA & ATCSCC Specialists that Stratus is clearing rapidly
5. 1730Z – GOES-16 loops shows stratus almost clear
6. 1747Z – CWSU ZOA reports Pilots are getting Visuals into SFO
7. 1756Z – ATCSCC cancels GDP

Original GDP impacted 48 flights @ 38 min average delay per flight

48 x 38 = 1824 minutes of delay x $81.00/min cost = **~$150,000.00 (Total Delay Costs)**

GOES-16 Estimated Savings:		GOES-W Estimated Savings:
32 flights freed up		16 flights freed up
32 x 38 = 1216 min of delay recovered x 81.00/min =	minus	16 x 38 = 608 min of delay recovered x $81.00/min =
~$100,000.00 (Costs recovered)		**~$50,000.00 (Costs recovered)**

Estimated cost savings related to GOES-16 = ~$50,000

Main Takeaway
GOES-16… 5 min updates & higher resolution –vs- GOES-W… 15 min updates & lower resolution provided AWC/NAM with earlier & higher confidence that clearing would hold.
Imparting this information to the FAA resulted in the earlier Ground Delay Program cancellation.

This GOES-16 image used preliminary, non-operational data that is undergoing testing.