

SLC ITWS Data: 14July2022

Overview: Archive data stored at the end user's display that is ideally used for accident investigations is not available; however, a more extensive archive, stored at the main system processor is available. This data set was used to recreate the products from 14July2022, as some useful information may still be provided. Details and limitations of this recreation are provided below.

Attached File: Attachment 2.pdf

- 39 SLC ATCT Situation Display screenshots from 00:40:00z – 01:17:54z
- Screenshots created at the PSF* during a Product Generator archive playback

SLC ITWS Archiving Capability:

1. **Situation Display (SD) Archives Not Available-** The archive files stored on each SD are saved on a 15-day rolling basis. At any given time, only the previous 15 days of data are available on the SD. These archives are normally used to reproduce screenshot pictures of the information that was available at the time of interest for a particular SD. This is the preferred information to provide for accident investigations. Such pictures, generated from the ATCT SD archives, would show the products available to the user at that display, and also the Ribbon Display Terminal (RBDT) alerts that would have been distributed from that SD to the RBDTs in the ATCT.
2. **Product Generator (PG) Archives Available-** The PG archives contain all of the weather input data that arrives at the PG from various sensors/sources. A playback at the PG with this data allows for a recreation of the weather products that get distributed to the SDs from the PG; however, not all products are exactly reproduced from this input archive data.

Reproducibility/Repeatability of Microburst (MB) Shapes, Wind Shear (WS) Shapes, and RBDT Alerts

A standard exercise to confirm products can be exactly reproduced with PG archives would be to compare the results from a PG playback with the SD archives. Since SD archives are not available, this comparison is not possible. In lieu of such an exercise, multiple other playbacks with the PG data were compared. A Test Tool (TT) playback was performed. This entails using an external system normally used for system certification, to playback the PG archives. Such a test sends data to the PG, simulating all live connections. Additionally, multiple PG playbacks were performed. Such a playback is performed internal to the PG system. Each of the results from the TT playback, and PG playbacks were compared; confirming all MB shapes, WS shapes, and RBDT alerts were identical during the time period of interest. Given these consistent results, it is reasonable to assume the recreated MB/WS shapes and RBDT alerts were replicated to match those that were produced at SLC on 14July2022.

Reproducibility/Repeatability of Gust Fronts (GF) and RBDT Alerts

The GF product is neither exactly reproducible nor is it repeatable while attempting to re-create the products of the archived day by playing back PG data (from either TT or PG playbacks). Reasoning for these differences are beyond the scope of this report; however, it is important to note, this is not new information. Although these uncertainties exist, because none of the playbacks with PG data of 14July indicated there were RBDT alerts resulting from GFs, and 'Wind Shear Alert Gains' were not heard in the voice recordings immediately around the accident, it is reasonable to assume there were probably not any 'Wind Shear Alert Gains' appearing live on the RBDTs at the time of interest.

Note-able Items Referencing SD Screenshots

1. “SLC – Ribbon Display Alerts” window:

Indicates the data that was being sent to the RBDTs in both the ATCT and TRACON. The runway IDs shown are associated with the runway configuration named “NORTH-FLOW”. This configuration was in use at the time on 14July2022, as the runway configuration cannot be altered by the operator during a PG playback.

2. Red “TDWR” status button:

The TDWR status button indicates the availability status of the TDWR backup products connection at that SD. The red status in the screenshots is a result of a TDWR backup display connection not being connected during the PG playback at PSF*. This is not reflective of the live status in the SLC ATCT on 14July2022.

3. Time:

The screenshot pictures were taken once per minute when the MB/WS shapes and RBDT alerts updated. The timing may or may not be the exact second that the RBDT alerts updated on the ATCT SD live on 14July2022. The time shown in the SD screenshots is believed to be not more than 30 seconds delayed from the actual time the RBDT alerts were present live in the ATCT. In a live environment, the MB and WS RBDT alerts are displayed in the ATCT not more than 2-3 seconds from the time of the TDWR data scan that is used to detect the alerts; however, due to this recreation of events and screenshot capture, a conservative 30 second buffer is noted.

4. Precipitation Sources:

- 5nm window- SLC TDWR surface elevation tilt
- 15nm window- SLC ASR-9 weather channel data
- 100nm window- mosaic of NEXRAD VIL product + TDWR VIL product
(VIL = Vertically Integrated Liquid)

(*) PSF = TDWR/ITWS 2nd Level Engineering Program Support Facility at FAA MMAC