

¹GMAC update

*B. Demoz; R. Sakai, A. Flores, D. Whiteman, D. Brewer,
M. Lataille, T. Reale, B. Sun, N. Nalli, R. Smith*



STAR Center for Satellite
Applications and Research
formerly ORA — Office of Research and Applications



UMBC



¹GRUAN Mid-Atlantic Consortium is an association of scientists that are interested in GRUAN, Sat.-validation, upper-air instrumentation

- *Serve as a USA-arm for GRUAN: science, advocacy, student and staff training*
- *Semi-Quarterly meetings for update and coordination*
- *Provide Science input to GRUAN and GRUAN-like activities by its members: NWS-SFSC; HU-Beltsville, STAR*

GMAC: National Weather Service Input

GMAC: The NWS Leg)

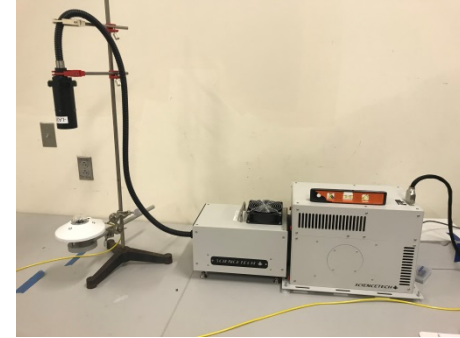
- **Extensive CFH operation and Training**
 - CFH training between SFSC and HUBC (discussed CFH + RS41 interfacing) & Performed test flight with CFH + RS41 payload
- **NESDIS NPROVS support for radiosonde evaluation and transition monitoring**
 - Dataset is used as an independent comparison of a radiosonde's profile.
 - Also used to monitor transition and major differences in newly deployed radiosondes (currently Alaska region)
- **NASA Wallops Facility Hosting Radiosonde Evaluation campaign**
 - 2 week intensive evaluation; with 4-5 vendors + CFH
 - **~20+ CFH-RS41 data in total would be public**
 - Sensitive acquisition for the U.S. NWS radiosonde transition **[Data is not public]**
 - performed in Egbert, Canada; will be performed in SGP ARM site (August).



GMAC – The NWS Leg: SFSC laboratory acquisition

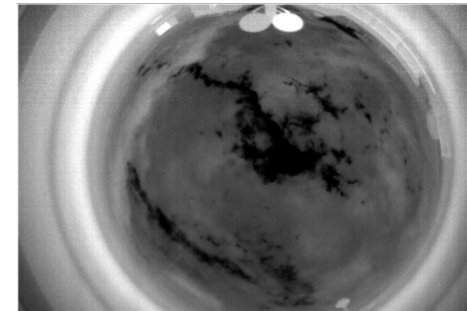
- **New Test Asset Goals**

- Solar Simulator- Quantifying measurement uncertainty
 - ✓ Benchtop test complete
 - ✓ Integration with altitude chamber in progress
 - ✓ Rotation device in development
 - ✓ 5 m/s aspiration method in development



- **Infrared Sky Camera- Providing irradiance retrievals and cloud imagery (both day and night)**

- ✓ Transportable to radiosonde evaluation locations
- ✓ Part of independent consensus measurements during each evaluation campaign.



- **Microwave Radiometer** – *Independent measurement of temperature and humidity and new technology for evaluation [Coming soon. this year]*
- **Standard Humidity (100% RH)** – Integration into test process in progress
- **New Autosonde** – Vaisala AS15 delivered in March 2019 for NWS training, evaluation, and document development. **The 3rd autosonde at SFSC.**

GMAC: Beltsville/GRUAN update

GMAC: Beltsville update



1) Is the end near?

| Year | RS92-41 | Comment |
|------|---------|------------|
| 2016 | 2 | December+ |
| 2017 | 45 | all months |
| 2018 | 45 | All months |
| 2019 | 20 | ongoing |

2) CFH is Getting harder

| Year | CFH |
|-------|-----|
| 2019 | 4 |
| 2018 | 7 |
| 2017 | 8 |
| 2016 | 6 |
| 2015 | 10 |
| 2014 | 3 |
| <2013 | ? |
| total | ~70 |

3) GRUAN O₃ Plan needed

| Year | O ₃ |
|-------|----------------|
| 2019 | 3 |
| 2018 | 24 |
| 2017 | 23 |
| 2016 | 21 |
| 2015 | 14 |
| 2014 | 16 |
| 2013 | 21 |
| 2012 | 18 |
| 2011 | 44 |
| <2005 | many |

- Beltsville- NWS Coordinated flights
- Cosmic flight 10 +
- Pandora + TOLNET operations

1) Change management: RS92 → RS41; Is the end near?

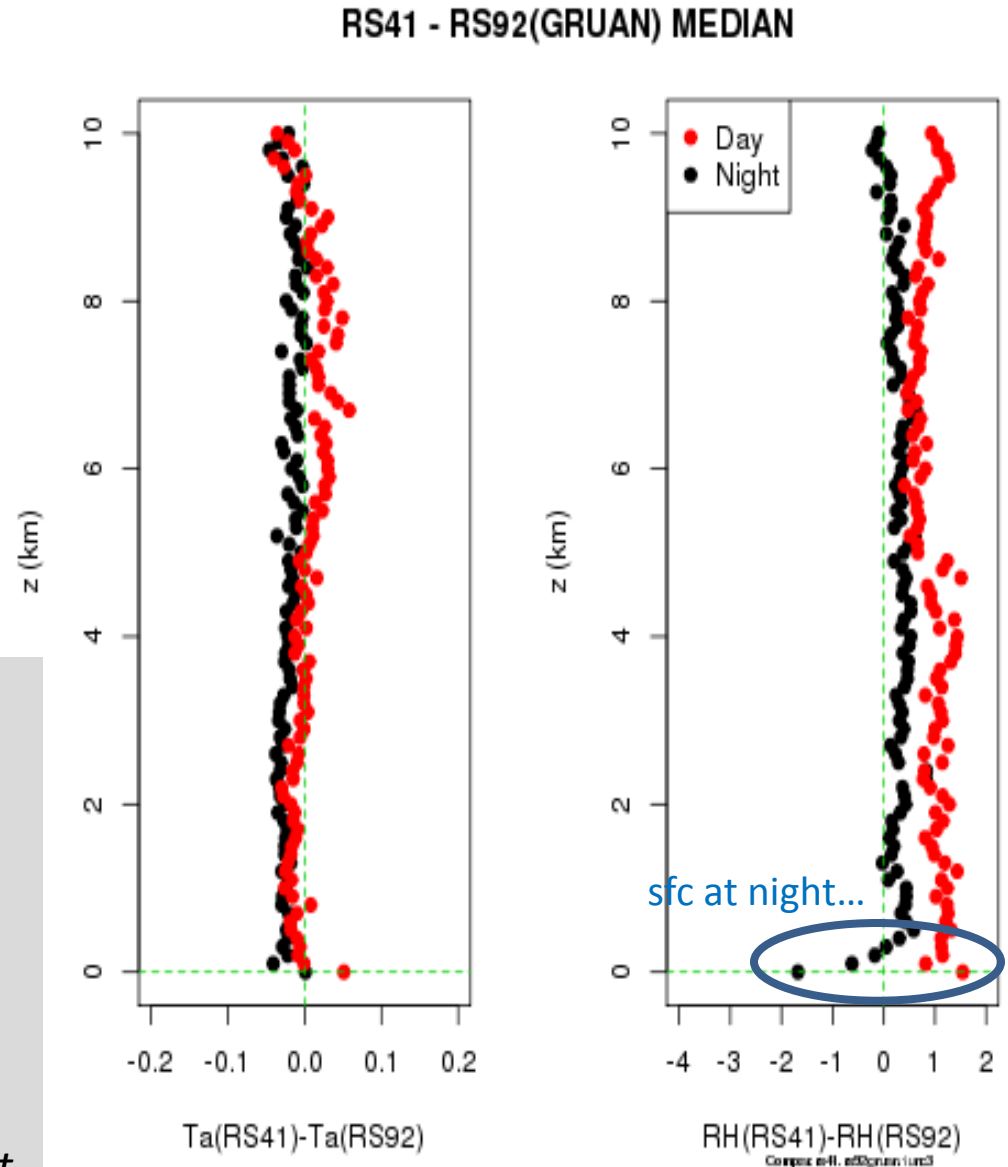
| Year | RS92-41 | Comment |
|------|---------|------------|
| 2016 | 2 | December+ |
| 2017 | 45 | all months |
| 2018 | 45 | all months |
| 2019 | 20 | ongoing |

Continue RS92-41 through 2019

Questions/Guidance needed:

- When is RS92-41 data collection to end?

- RS92: Can RH data below 1% be provided in MW41 [MW31 allowed that option]

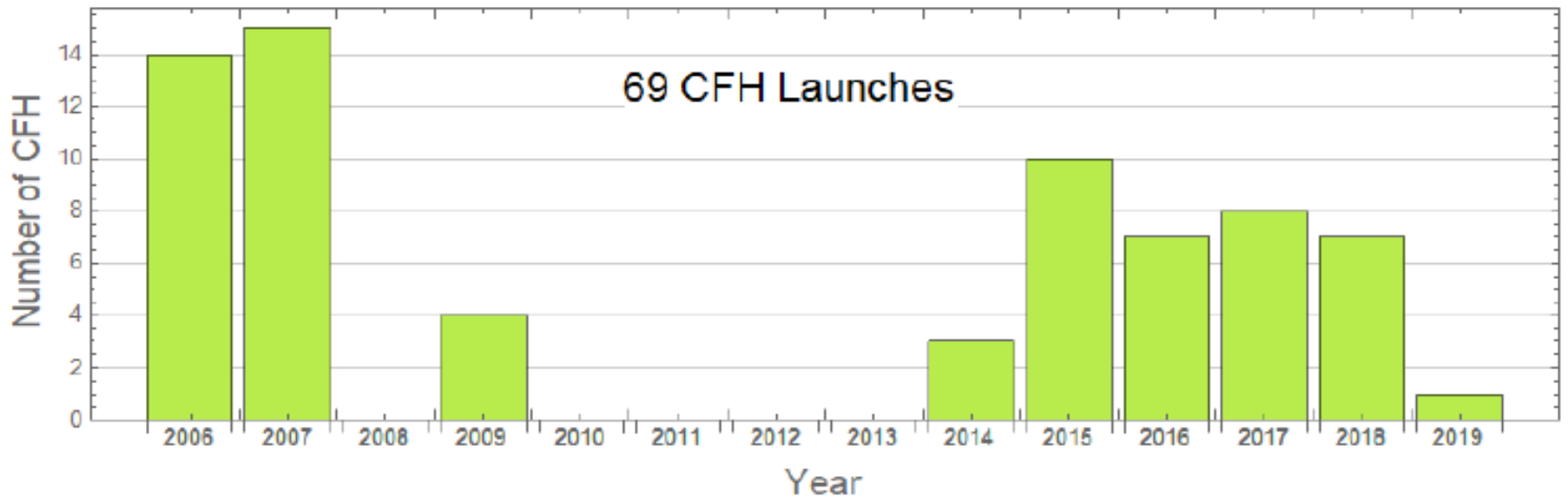
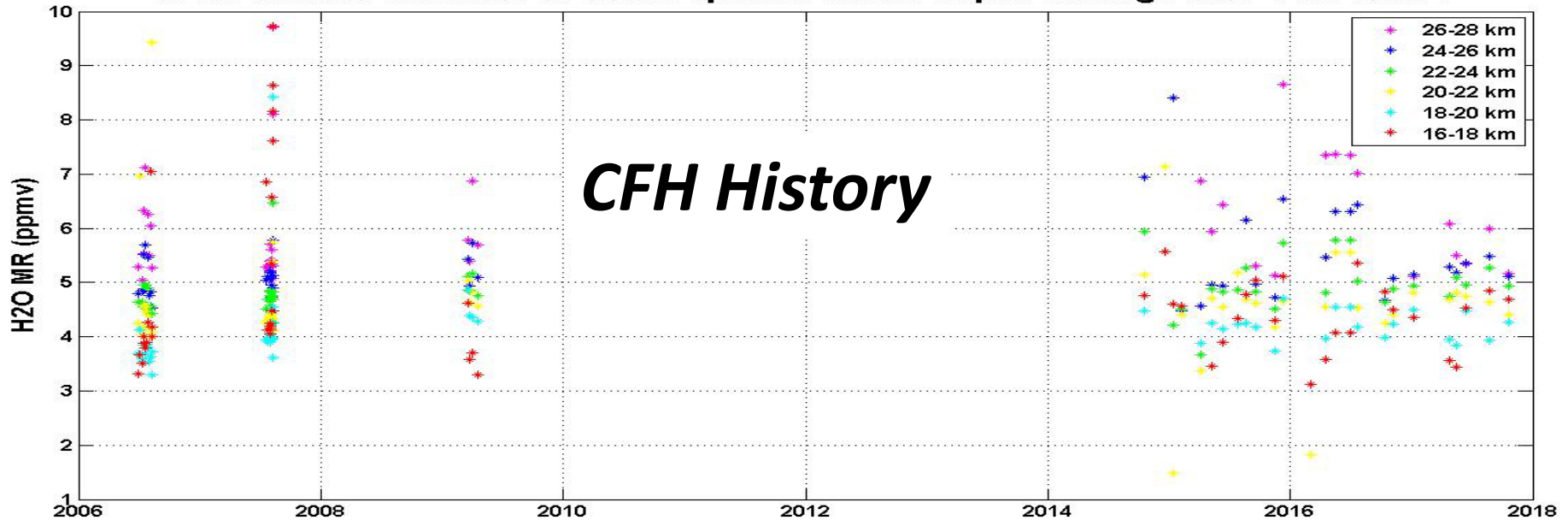


RS41 ~1% moist below 5km

GRUAN processing reduces the diff.

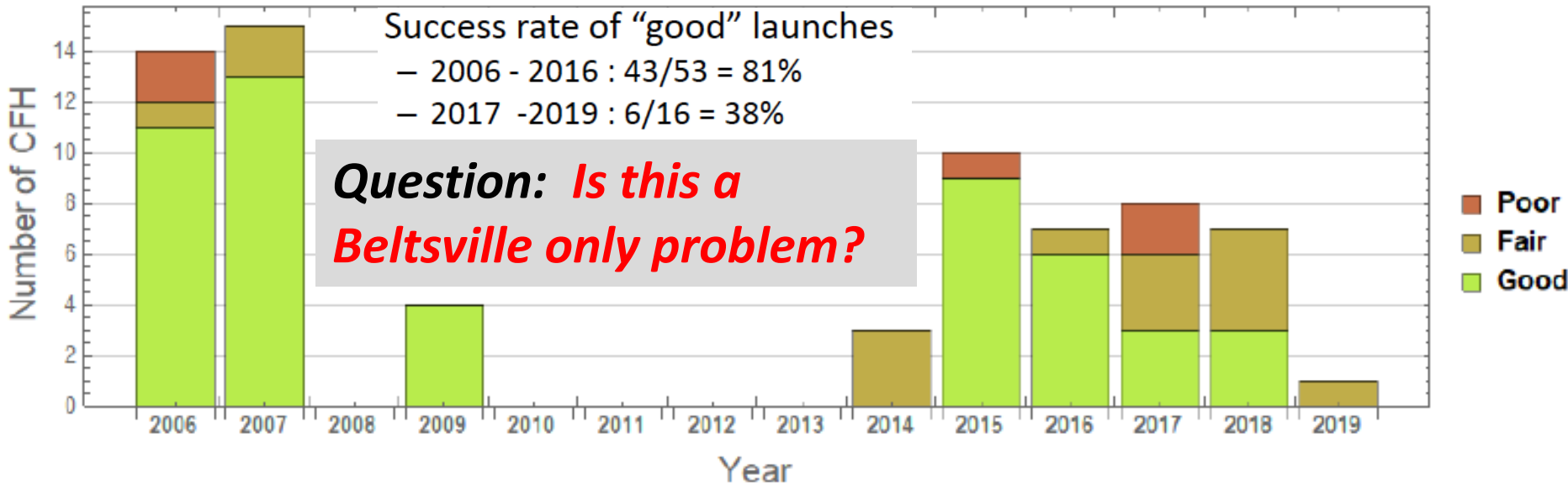
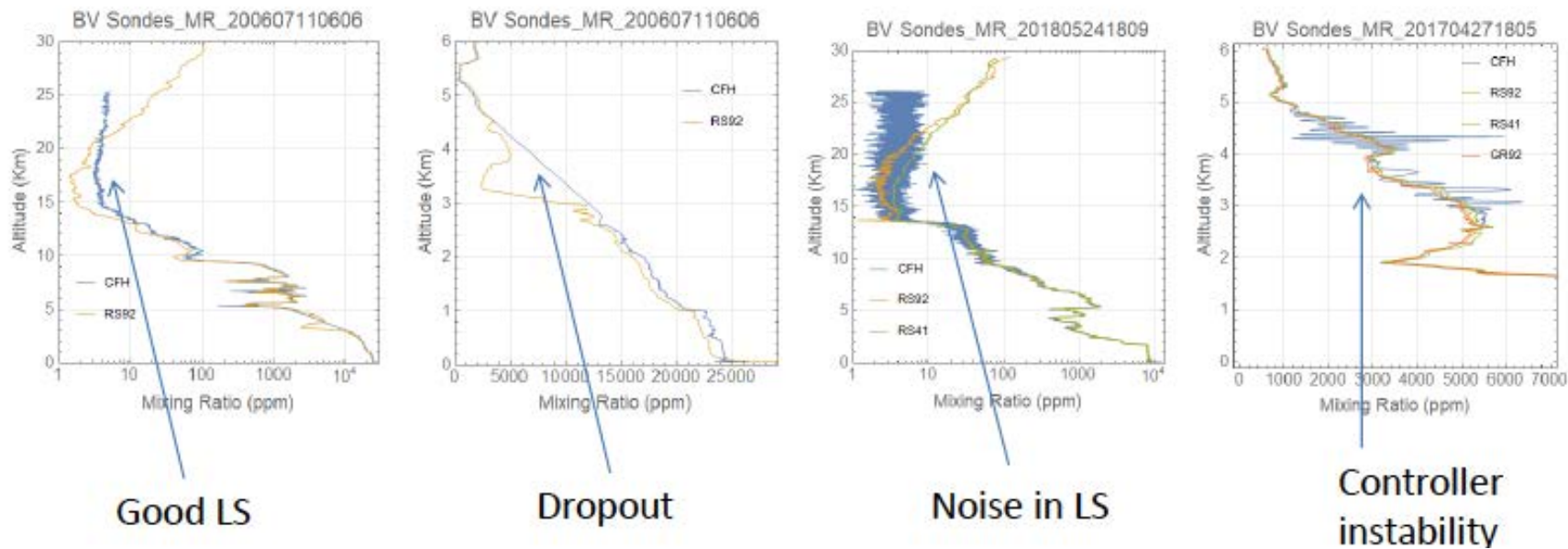
2) CFH is getting harder: In need of a solution

CFH Altitude Intervals of Stratospheric Water Vapor Mixing Ratio over HUBC



2) CFH issues: RS41-CFH interference?

Currently investigating the "issues" with Whiteman/Holger



3) Ozone: record goes back to 2005 *with meta data.*

Funding: OWLETS (State/NASA); Pandora (NASA); State (MDE, Sonde); NGIA

| Year | # O ₃ |
|-------|------------------|
| 2019 | 3 |
| 2018 | 24 |
| 2017 | 23 |
| 2016 | 21 |
| 2015 | 14 |
| 2014 | 16 |
| 2013 | 21 |
| 2012 | 18 |
| 2011 | 44 |
| <2010 | ?? |



- *Include past data into GRUAN? How?*
- *Re-processing discussion (Anne Thompson)*
- *Integrate with Pandora network?*

GMAC: NOAA-STAR update

(Tony/Bomin will deliver)

- *RS92-RS41 concurrent with N-20 Beltsville launches*
- Thank you Axel for **Overpassdata BEL data**.
Discussions for targeting: MetOp-C and others
- AEROSE deployment RS41 ~100+ over the Atlantic
- GRUAN processing of RS41 ... radiance space (*Bomin, GSICS*)

Summary: points for discussion

1) CFH issues are becoming critical.

- **Cost is becoming an issue (critical)**
- **RS41-Interference (only Beltsville? Who else?)**
- **R2 availability (not an issue so far in the US)**
- **Central processing (LC takes charge CFH/FP processing)**

2) RS92-41: Is the end near?

3) GRUAN Ozone product needs a plan/strategy

- **Thanks Richard for your suggestion yesterday**

Other Points for discussion

A22: UT/LS GRUAN responsibility? This charge to GRUAN needs a careful discussion – especially the LS part of the water vapor.
I read it as CFH & all the problems that brings about.

C12: Usage of GRUAN data and acknowledgments. This is important for the sites to show data usage. ***Is there a data identification protocol that GRUAN can use? [David Smith]***

Burst Altitude: Justification for the need to reach 10mb? What is the science justification? Is it published?

Multi-payload: it was stated that a “scientific studies is needed” – this is a difficult paper to accomplish and an expensive one to test the many configurations.



Norman - 1



Lindenberg - 0



De Bilt - 5



Payerne - 2

What has GRUAN accomplished so far?



Greenbelt - 6



Queenstown - 3



Helsinki-9



Matera - 7



Tokyo - 4



Lindenberg - 10



Boulder-8

You are dreaming now ... nightmare scenario:

What if Vaisala decides to replace the RS41?

- ***Can they? Should they? Is there a business case to do this? A scientific one?***
- ***GRUAN has no say – or? I would hate to go through the change management again!***

You are dreaming now ... Wake up! Wake up!

... it's only a dream.