

# RICH Assembly Status

Detector Support Group

March 8, 2017

# DSG Staff



# Contents

- Assembly Structure construction
- Interlock system
- Gas System
  - Air cooling
  - Nitrogen purge

# Assembly Structure Construction

- Extruded aluminum structure used to support RICH during detector assembly
- Contributions from all DSG
- Complete 2017-03-07
- Ran into issues along the way

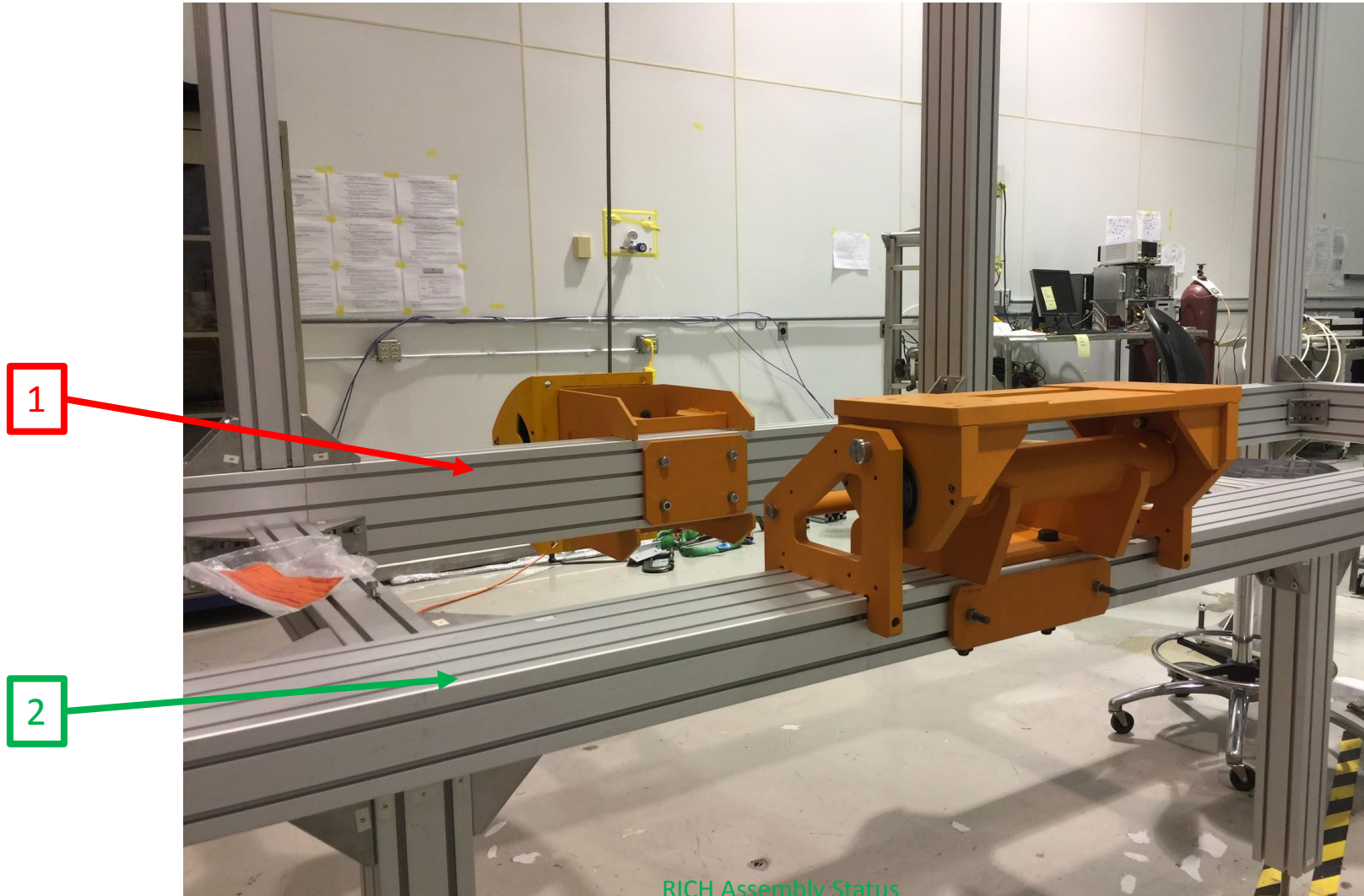
# Assembly Structure Construction Issues

1. Two beams labeled TA-STR-011 with different sized holes.
2. Ran out of two-threaded-hole Robomec nuts
3. Hardware is missing or is wrong size.

# 1. Two beams labeled TA-STR-011 with different sized holes.

- Problem
  - Two beams with TA-STR-011 part number.
  - After installation in structure, noted hole sizes in each beam were different.
  - Holes needed to attach winch and pivot were not in correct location.
- Solution
  - Swapped location of the two beams labeled TA-STR-011.

# TA-STR-011's

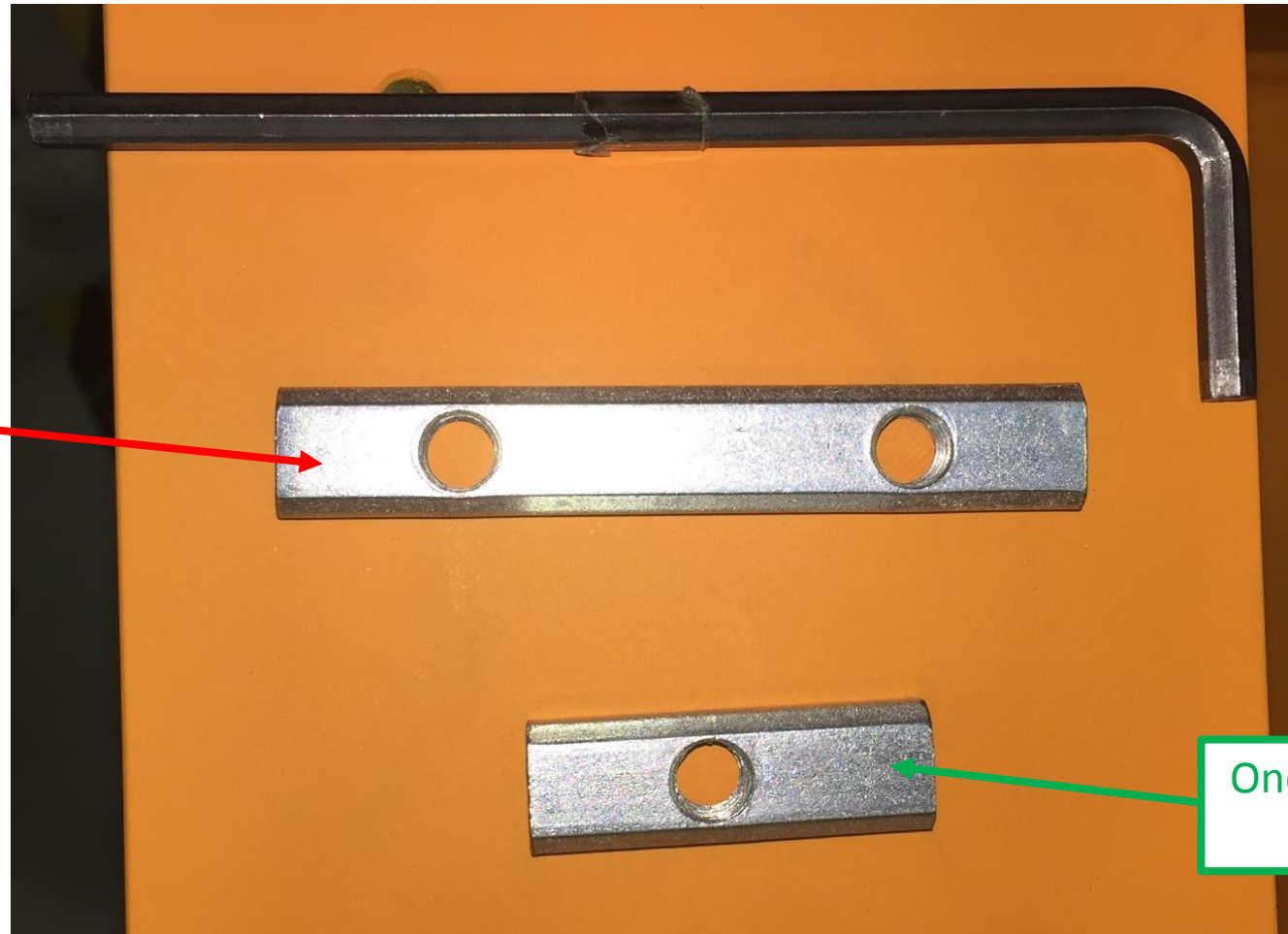


## 2. Ran out of two-threaded-hole nuts

- Problem
  - Robomec nuts with two threaded holes called for to attach joint brackets to Assembly structure.
  - At end of procedure, we were short three two-threaded-hole Robomec nuts.
- Solution
  - Used one-threaded-hole nuts in place of missing two-threaded-hole nuts.
  - Where one-threaded-hole nuts are called for are not as critical
    - Regular M8 nuts can be used instead.



# One-Threaded-Hole vs. Two-Threaded-Hole



Two-threaded-hole  
Robomec nut

One-threaded-hole  
Robomec nut

# 3. Hardware is missing or is wrong size

- Problem
  - Several steps for Assembly Structure construction and detector shell assembly require different size bolts, threaded rods, or screws than what was received.
- Solution
  - Procured correct size bolts, threaded rods, and screws.

# Completed Assembly Structure (2017-03-08)



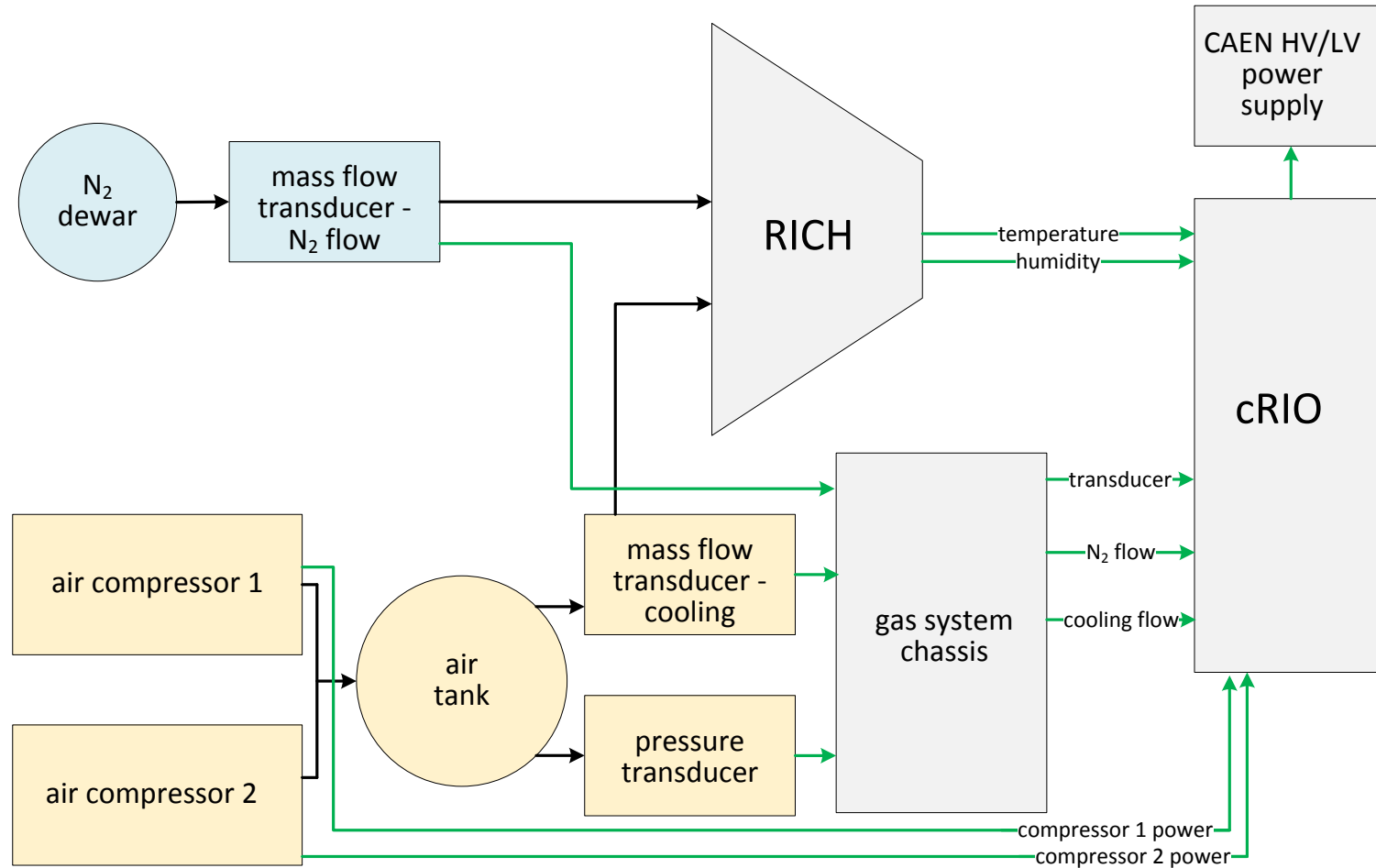
# Detector Shell Assembly Progress (2017-03-08)



# Interlock System Status

- Interlock system will monitor:
  - Temperature
  - Humidity
  - Air cooling flow
  - Air pressure
  - N<sub>2</sub> flow
- cRIO chassis assembled and wired by Mindy.
- Operating system installed and cRIO tested by Peter.
- LabVIEW subVIs currently being written by Mary Ann.
- More information needed:
  - Limit values
  - Actions taken in event of an error

# RICH Interlock System Diagram





# Gas System

- Air cooling
- Nitrogen purge
- Designed by George
- Components assembled by Mindy and Sahin.
- Both systems on hold as of March 7, 2017.
  - Design authority (DA) approval and modifications underway



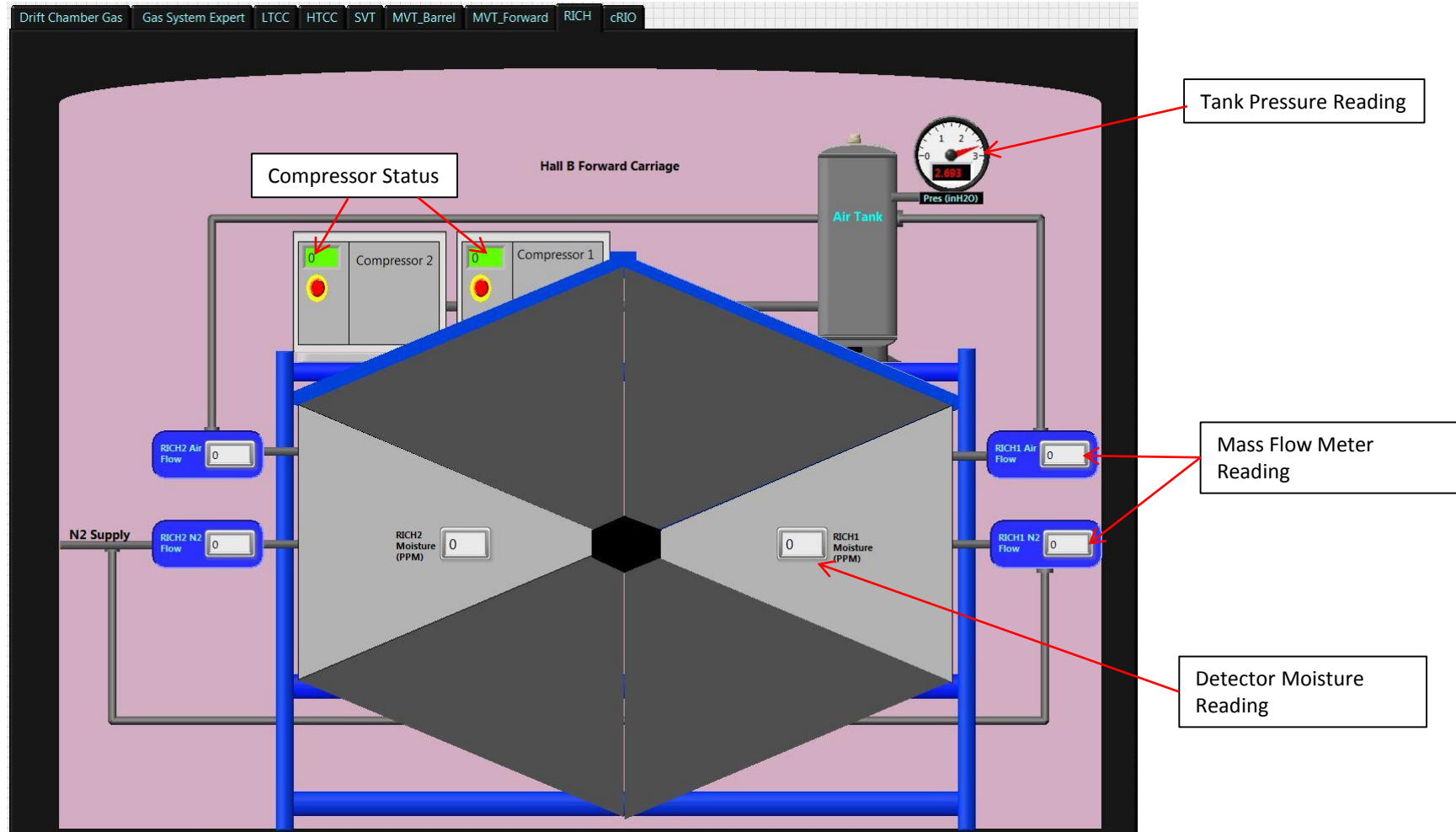
Air compressor for cooling system in EEL 125.

# Gas System Controls

- cRIO-based monitoring.
- Developed by Marc and Brian
- RICH gas system does not control gas parameters
  - Receives and displays values using shared variables from RICH interlock system.



# RICH Gas System GUI



# Upcoming Tasks

- Complete assembly of detector shell
- Complete interlock system
- Modify gas system to meet DA's recommendations
- Install internal detector components
  - Mirrors
  - Electronics
  - Aerogel

# Conclusion

- Construction of Assembly Structure complete 2017-03-07.
- Detector shell assembly underway.
- Interlock system development underway.
- Gas system hardware under modification to meet DA recommendations.
- Gas system software developed.

Thank you