Ammonia Combustion Technical Working Group Meeting Minutes

Sep 2, 2025

- GA Tech - Ben Emerson - Progress with NH3 Combustion Research at Georgia Tech
- GA Tech Q&A
    - Jackie Chen
        - Can you bring secondary air in axially or use heat from first stage to preheat secondary air?
        - Mixing is critical so axially staging could be interesting to do. Heat transfer from walls also critical.
    - Clint Bedick
        - Were hole size and spacing in second stage based on empirical relations?
        - Not so much. Just wanted to try a few options and see what worked.
    - Deore Pravin
        - Can you use swirlers in second stage?
        - Yes it's a good idea. They've looked at multiple strategies for hardware to improve 2nd stage mixing. Jets do pretty well. And hardware in flow would not be very durable.
    - Clint Bedick
        - Is U0 just a bulk velocity?
        - Yes. With ammonia, have to turn down velocity significantly (~1 m/s)
- Purdue - Bob Lucht / Alexander James Hodge - Ammonia Combustion at Purdue
- Purdue Q&A
    - Guillermo Barrios Cadensa
        - Noticed brighter OH signal on upper portion of image
        - Sheet comes from top to bottom. Get laser absorption along sheet path. Could be corrected in post-processing.
    - Clint Bedick

        - Fill accumulators with bottle pressure. Can you draw vacuum on other side to assist?
        - They do pull vacuum when they start filling but only at the beginning. Pressure differential is really just from a temperature differential.
        - How long to fill accumulator?
        - 5 to 10 minutes once conditions are met. Can take an hour to get to those conditions
    - Jackie Chen
        - Is there a technique that could get you from FSD to a flame stretch factor or local consumption speed?
        - Planning to do PIV to get velocity field in addition. Also planning NH-PLIF to get better idea of reaction zone location.
        - Jackie - would be good to get an idea of thermo-diffusive instability with H2 blends
    - David Wu
        - Can you do fuel or air preheat?
        - Limitations on vaporizer and flow rates. It is possible but haven't focused on that yet.
- Open Discussion