INL/CRADA-05-13

CRADA FINAL REPORT

Plasma Assisted Combustion

Idaho National Laboratory

and

Los Alamos National Laboratory and Perriquest

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CRADA Close-out Report

In this CRADA INL has only a minor supporting consultation role. LANL is the main developer responsible for the technology development in this CRADA. INL's role was to provide design review and make suggestions when appropriate, review LANL reports, and assess the plasma assisted combustion (PAC) technology at PQ facility.

- INL participant reviewed LANL's PAC injector concept and provided feed back.
- INL participant reviewed LANL's 1st and 2nd interim reports and no comments were necessary.
- INL participant 1st visit to LANL and the PQ facility in Santa Fe was between 06/07/2006 and 06/09/2006 to get acquainted with LANL and PQ participants and tour the PQ facility.
- INL participant 2nd visit to the PQ facility in Santa Fe was between 10-15-2006 and 10-17-2006 to participate in engine test. There were several attempts to start the plasma and ignite the fuel in the engine and the trials were not successful. The participants discussed the potential reasons why the plasma would not start. The LANL team took the engine apart and revealed the plasma starter configuration. The INL participant noticed the starter position could be too high and the pilot or starter arc might not extend beyond the perforated metal shell below the arc starter housing. The INL participant asked the LANL team to engage the plasma starter and observe the arc physically. Sure enough the INL participant observed the starter arc terminated on the bottom of the arc starter housing. The arc did not extend to the perforated metal shell below. The INL participant indicated if the arc did not touch or extended beyond the perforated metal shell below it would not see the fuel vapor at all then there would be no arc ignition. The INL participant suggested LANL participants modified that part of the system and allowed the arc to terminate on the perforated metal shell so the fuel vapor could be ignited. It was not known the suggestion was accepted and followed.

After this trip the INL participant sent several emails to LANL participants and asking for the next time that they would run the engine again so the INL participant could come to observe the engine running. The INL participant received no correspondences from the LANL participants.

The INL participant saw the short article "Reducing Fossil Fuel Emission" published in **Innovation** (Dec 2006-Jan 2007 issue) about the PAC studies on the turbojet engine. This was the first time the INL participant learned of the operational PAC on the turbojet engine. The information was in the public domain and the INL participant had a feeling that LANL really did not want INL to be involved in this CRADA from the beginning. INL was not involved in the CRADA project kick-off meeting.