

Dan Hawk, First Nations Initiatives AD

Report for April 2015 WSGC Directors Meeting

Currently I am helping perform two NASA-based programs they are 1) First Nations Launch (FNL), and 2) Tethered Aerostat Program (TAP) and working through several ideas that may create opportunities for WSGC in the future. Some of these new ideas are: 1) CubeSat initiative, 2) deep-space CubeSat RTGs, and 3) high-altitude rocket performance to 25,000 feet at Badger Ammunition Plant.

FNL started with College of Menominee Nation launching their sustainable “Golden Eagle” rocket in 2006 using a K550 motor. “Golden Eagle” is now in the Smithsonian in Washington, DC. FNL allows national tribal and Native university level engineering teams to design and build a high-powered rocket and fly it in competition using NASA procedures starting with the Preliminary Design Report (PDR) and ending with a post flight assessment (FR). There are three competitions this year, 1) tribal rockets carry an onboard “Climate Change” experiment, 2) AISES cluster motor competition of three high-powered motors to 4,000 feet AGL, and 3) a two-stage rocket to 4,000 feet.

TAP provides three Wisconsin college units commercial aerostats that can fly payloads to 500feet for long-duration experiments and field work. The college units are Western Technical College, College Menominee Nation, and UW- Fox Valley. This is a two-year program. The current ideas for payloads are 1) pollution monitoring, 2) forestry monitoring, and 3) Ka-band power beaming in support of an upcoming NASA funded ISS to BitSat demonstration.

For the past two summers I have worked on BisonSat at Salish Kootenai College in Montana. BisonSat a 1U CubeSat will be the first Native American satellite in orbit and will be launched later this year. CubeSats bring another element of space application to WSGC. I believe Marquette University has recently been CubeSat Launch Initiative (CSLI) selected.

Currently there are no power applications for CubeSats in deep space yet, NASA has awarded some university funding for deep-space CubeSat proposals. I am currently looking at solutions for CubeSat power in deep space they include power beaming and Americium-Lithium RTG (radioisotope power supply).

While FNL provides high performance rocketry it is also the case with Wisconsin Collegiate teams. In the past there have been problems with rocket launches at the Richard Bong Recreational Area. This led to discussion with the Ho-Chunk Nation about using the Badger Ammunition Plant as a possible h-a rocket launch site. It appears that all is well with future rocket launches at Richard Bong, however, Ho-Chunk Nation would consider rocket launches of higher altitude up to 25,000feet. Consider, last year we had one team break the speed of sound but also broke the 10,000feet waiver. I would like to see one high-altitude rocket launch competition at an interval of once every 3-5 years. The idea of a WSGC and Ho-Chunk Nation partnership would enhance WSGC capabilities. Consider, I believe, Orbitec has performed their cold-walled vortex engine testing at Badger Ammunition Plant.

End of Report.

Dan Hawk