**Final report for work performed**

**BPA NNK14OL05Z Subtask 021**

**DON**

**7/17/2015**

Task 21 has a period of performance of May 11 to July 31. It got a late start due to some difficulty with setting up the task order. Boeing didn’t get the award until late May. Our kickoff meeting with Mike Conroy was held in early June. The statement of work specifies a delivery date of July 17 on a task with an end date of July 31.

In June, DV provided a poster to Mike Conroy, produced a 3D-printable model for Matt Verdier, and worked on optimizing the PHSF simulation environment for export to DON.

Due to workload, the developer (Principal Engineer) was not fully available early in this contract, so much of the development work was pushed to later in the performance period.

A basic CGR-level COLLADA exporter was completed on July 7. This was running in a special test module to accelerate development. This exporter was unable to export texture maps because CGR (CATIA Graphical Representation) files can have embedded image data. This differs from almost all other formats that simply reference external image files by name. This complicates the management and naming of texture files because the exporter tries to be careful not to introduce duplicates and tries to keep the original file names. Luckily, for the main use of CGR files does not require textures as they are often applied at the assembly level. Support for texture files used in CGRs was left for later implementation.

Once the basic COLLADA exporter was complete, the next step was to integrate it with the larger assembly-level COLLADA exporter. This process revealed some flaws in the existing design that had to be partially remedied before integration could proceed.

The assembly-level COLLADA exporter was completed on July 16. It was working well enough to export the CGR-based fragments of the PHSF simulation that we had been unable to export before this new work.

While testing with this PHSF simulation, a few pre-existing bugs in the COLLADA exporter had to be fixed to allow the full assembly-level export to complete. This was completed on July 17.

A DON simulation was delivered on July 17th to Mike Conroy. This simulation is missing a few post-export manual modifications that it needs to look good.

* It needs its TIFF textures converted to PNG because DON has not been able to read TIFF files. This means modifying the texture file extensions in the MTL file to refer to .png files instead of .tif.
* DON doesn’t support the “-clamp on” syntax in the MTL file spec, so we have to manually remove that from all of the MTL files.
* The COLLADA exporter does not currently export lights, so they must be added manually to the DON mission configuration file.

These modifications will be completed over the weekend in order to deliver a better-looking DON simulation by Monday, July 20.

As of July 17th, this task still has 40% of its budget remaining and two work weeks left in its period of performance. This time will be spent adding features and robustness to the exporter.

* Implement texture extraction and de-duplication during export of CGR data to COLLADA.
* Re-design the material-handling module in the COLLADA exporter to properly handle some of the subtler interactions allowed by CATIA/DELMIA. The current design is unable to handle some rarely-used combinations of features such as graphics properties partial inheritance from the assembly level to the shape or part level.
* Implement the export of transient geometry that is dynamically generated at the assembly level. This includes ergo-men and some types of pipe and wire runs. This was working in the VRML exporter; much of this should be copy-pastable from there.