Voluntary Questionnaire for MBSE Benchmarking

This request is issued by the Mission Operations Directorate (MOD) at the National Aeronautics & Space Administration/Johnson Space Center (NASA/JSC) regarding Model Based Systems Engineering (MBSE) benchmarking. We are seeking voluntary information from industries that have applied Systems Engineering and Integration (SE&I) techniques (particularly MBSE) to large complex projects,. The purpose of this is for industry to share their experiences and lessons learned.

The MOD Flight Production Process (FPP) is the collection of work tasks (business processes) conducted across many technical disciplines that are executed for each space mission to plan, train and execute flight operations. The FPP re-engineering project’s focus over the last 3.5 years has been to transform MOD into an agile organization able to quickly meet the needs and opportunities that arise in the next decade.

For current and future space programs, MOD established a process that will:

* Increase process efficiency
  + Eliminate function and activity duplication
  + Reduce manual data entry
  + Reduce or eliminate data format conversion between software tools
  + Reduce configuration management steps
* Reduce costs
* Reduce the mission preparation schedule length
* Integrate the production templates and systematically analyze the overall process
* Increase process and system flexibility to serve more customers

With the ongoing effort to further refine the MBSE process for human space missions, MOD has developed a set of questions to gather information for the benchmarking activity. No future procurement activities will result by providing responses to these questions. If you are interested in sharing best practices, experiences, and lessons learned in the application of MBSE or similar SE&I techniques, please supply name, company, position and contact information to:

Jason Kruska

Johnson Space Center

(281) 483-4088

[Jason.Kruska-1@nasa.gov](mailto:Jason.Kruska-1@nasa.gov)

MBSE Benchmarking Questions

1. In what large complex projects have you utilized a model based approach? What have you learned from them?
2. What are examples of problems that you have addressed using a model based approach?
3. What was the scope of the problem you helped resolve (hardware, software, system level, enterprise, etc.)?
4. How did your approach help solve the problems?
5. Where have you found MBSE is best applied?
6. How have you used MBSE to model and refine processes (operational or production or a combination of the two)?
7. Did you consider approaches other than MBSE?
8. How do you identify which processes drive the system design and architecture?
9. What architecture framework did you use and why?
10. What software tool(s) did you choose and why?
11. What have you learned about how deeply to model the process? How do you decide the level of detail?
12. Have you tried to re-use models? What problems have you observed?
13. What was biggest obstacle in implementing an MBSE approach?
14. What have you learned about breaking down organizational resistance to using MBSE?
15. How has your approach been used to improve the efficiency of the process? How is improvement measured?
16. Have you been able to tie cost data to the models in order to assess project costs and impacts of changes?
17. What was biggest payback (money, efficiency, other)? What percentage of improvement?
18. Can you quantify the return on investment?

Please send responses along with name, company, position and contact information to:

Jason Kruska

Johnson Space Center

(281) 483-4088

[Jason.Kruska-1@nasa.gov](mailto:Jason.Kruska-1@nasa.gov)

9-8-2011