Problem: For this written case study homework, discuss the first step in DMAIC, “Define a Problem” either as they did it for something in the above study, or as you would have done it in hindsight:

* Identify and describe a problem to be solved or improved (hint: the absence of a particular solution is not a good problem statement).
* What are the measurable attributes of the problem (hint: what would you measure on the program to know that the problem had been solved)?

Throughout the Case Study on NASAs SSCS, there were a number of problems that could have been easily at least improved if not completely solved. Here’s a list of problems chronologically noticed throughout the Case Study:

* Lemke was brought on as a newly assigned project manager. As a former experienced avionics engineer he probably had a lot of niche knowledge but lacked project management knowledge to ease him into the role. He was going from limited management experience to not just taking over a project manager role but a project manager role on a struggling project. Sounds like he was put into a trial by fire.
* He asked for engineering drawings at a meeting with the customer. By doing so he showed NASA that if the project manager doesn’t know what’s going on, how does anybody in the program know what’s going on?
* No engineering drawings would be an immediate red flag for organized planning and just how far behind schedule the program was.
* NASA’s rationale for designing the system in-house seemed like it had good intentions but outsourcing the work for $20 million compared to $90 million seems like a drastic jump to where I’d question what aspects of the product they’re saving so much money on. Seems like such a price slash that they’d be sacrificing expertise in quality.
* Project starts off with drastic reorganizations. Leads to additional confusion building on top of the confusion already present from starting the new SSCS project. The Case Study states the reorganization caused mixed morale which is hard to measure but the effects and long-term impact can be huge (people leaving the program and their expertise, knowledge doesn’t get shared, etc.) Mentions key engineers didn’t want to work for the Project Management Office which again, is hard to measure how much better the project would have been with their expertise but those directly involved in the project can get a sense of the chaos that happens as a result. Many engineers and all of the contract designers left too. Too much change and loss of expertise to change at the beginning of the project.
* Lemke could have gone to management to state of the gravity of the situation but chose to persevere because he had motivated workers. BIG MISTAKE. As far as motivation will go, employees will still only have so many hours that they can work in a week and their production rate compared to more experienced workers with a deeper understanding is hard to compare. Not to mention, contract compliance throughout all stages would surely cost time and money with inexperienced engineers.
* Lemke should have set technical progress measures for time constraints instead of relying on schedule pressure associated with Space Station.
* One of the major problems was hoping to fix the DVTUs in a piecemeal fashion rather than inserting another DVTU cycle to improve the design and address the problems at a system level.
* Lemke left management role leading to more chaos.
* High-risk scenario product that couldn’t afford to have the possibilities of realistically failing. Continued to push the product forward with tight deadlines instead of asking for time deadline revisions to go back and analyze how they were designing and manufacturing the parts.

After listing out some of the problems I noticed, I would focus on avoiding reorganization at the start of the project. The start of the project is when it’s easiest and most cost-effective to make changes to the design and other aspects of the product. By key talent leaving the program, the SSCS project was left with little experience to set up valid designs that would hopefully bring the project back on track and retain quality.

By not reorganizing, it could be measured by employee retention and more specifically, the amount of employees leaving the program and the number of years of experience each member has in their career and program specifically. Retaining employee experience could have made for a more balanced approach and in the future of the program, less experienced members could have been phased in to add contributions quicker while learning from the more experienced members. This would have helped retain quality of the product because experienced members would be making more contributions. Schedule deadlines could have been met quicker and maybe not as much work would have had to have been outsourced to Litton.