

Welcome and Al Diaz Introduction  
23<sup>rd</sup> GSFC Software Engineering Workshop  
December 2, 1998

Hi, I'm Marti Szczur, the Chief of the Information Systems Center, which is one of the organizations within the Applied Engineering & Technology Directorate (AETD).

Since last year's workshop, Goddard has undergone a significant reorganization. AETD is one of two new directorates, made up of over 1300 Goddard engineers, including computer science professionals. The engineers are matrixed or assigned to flight projects, science directorate activities and/or advanced technology tasks. ISC is one of the engineering groups within AETD, and as the name implies, the Information System Center is heavily vested in all aspects of software (from design, development, testing, validation, integration, maintenance, and including assessment of existing software products.)

The software is applied to a broad spectrum of mission and science systems ... from command & control of the spacecraft (both on-board and on the ground) to planning/scheduling, guidance & navigation systems, communication support, to the processing, archival, & distribution and analysis of science data ... Software is one of the key business products within the ISC.

And thus, my interest in software engineering is extremely high. In fact, the Software Engineering Lab, the group hosting this workshop, resides within the ISC, and I am a strong supporter of the research they conduct. I'm also interested in their expanding their software engineering knowledge and influence across Goddard, as well as NASA. Because of my vested interest in SE as a computer science discipline, it is quite a privilege for me to be opening this 23<sup>rd</sup> Software Engineering workshop.

I'd like to mention a recent exercise at Goddard, which involved looking ahead to the year 2003 and defining the type of work and missions in which we would be involved. And, the future missions identified have increasing software complexity, such as

- operation of multiple spacecraft and constellations
- distributed sensing systems
- increased on-board science processing and autonomous operations
- higher volume/higher rate of science data to process, manage, archive and distribute
- collaborative, distributed engineering and science computing environments to improve formulation and implementation of missions, as well as to foster collaborative scientific discovery.

To meet these software challenges, It is critical that advancements in software engineering be made. Today, the software industry has not been overly successful in consistently developing software systems that are within budget or on time or which meet all the requirements.

For example, in a Standish Group's 1994 study\*, based on an evaluation 8330 industry software projects, only 16% were actually successful in being on-time, in budget and meeting all originally-specified requirements,

A staggering 53% were "challenged". On an average, they were (1) 189% over budget, (2) had time overruns of 222% and (3) only 61% of originally specified requirements were met.

The other 31% of the software projects were canceled somewhere during development.

Thus, with the increase of NASA mission's dependency on software and the increase in its' complexity, a focus on producing quality software, and thus software engineering, I feel, becomes a critical necessity.

And, it is many of you in this room who will move us in a direction to enable a time when we can develop software systems which are bug-free, reusable, delivered on schedule and within cost while meeting all requirements...on a consistent basis.

Many of the presentations over the next two days pertain to advances and lessons learned which are directly related to the software engineering challenges we face. I look forward to listening and learning from the diverse collection of international experts represented here today.

I have the privilege this morning to be introducing, Al Diaz, who is the Director of Goddard Space Flight Center.

We are very lucky at GSFC because Al, I believe more than any other Center Director to date, has an appreciation of the critical role software ... and in particular QUALITY software ... plays in the success of Goddard's missions, and he recognizes its increasing role in the future.

So, with pleasure, I welcome Al and thank him for agreeing to take time from his incredibly busy schedule to open the 23<sup>rd</sup> Software Engineering Workshop.

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\* NOTE: The Standish Group International, Inc. is a market research and advisory firm specializing in mission-critical software and electronic commerce. Information about this study can be found on their web site: <http://www.standishgroup.com> Go to the option titled "Chaos Report."