

OVERVIEW OF MSC'S PEOPLE, PRODUCTS AND PLANS

by

**Joseph F. Gloudeman
President and Chief Executive Officer
The MacNeal-Schwendler Corporation**

INTRODUCTION

Welcome to MSC's 1990 World Users Conference! My presentation is divided into three sections: People, Products and Plans. Let's start with a look at our current organization structure.

MSC ORGANIZATION STRUCTURE

Here we see a combination of new faces in new positions and familiar faces serving different functions. This is intended to help us better focus on our client needs - especially with our newly diversified product line.

This diversification is not a random, haphazard movement - it is part of an orchestrated strategic thrust and directly results from intensive planning efforts in keeping with our Corporate Mission to provide quality engineering software and related support services for the long term. Our inputs come from our Board of Directors, senior management and technical people, clients, hardware and software partners, international business and technical forecasting, competitors' moves and partners in universities and government research organizations.

Version 66 of MSC/NASTRAN proved to be the most challenging undertaking from every aspect: its initial design and development; the integration and performance fine-tuning; the intensive quality assurance testing; the releases and subsequent re-releases; and, the additional challenges brought about in coping with proprietary non-UNIX-based operating systems software.

MSC has now adopted a Program Management approach in which each major project is assigned to a Program Manager. This is a highly demanding responsibility because of the need to simultaneously deal with external market issues and internal planning, scheduling, tracking, and providing visibility and action, where needed, to cope with perceived shortcomings.

The changes reflect the maturing of the E/EAD organization in Milwaukee. Also reflected is the internal development efforts in adapting DYNA3D to meet stringent client requirements leading to the production of MSC/DYNA as a software tool for impact analysis. Also reflected are two acquisitions which took place in November 1989: Noetic Technologies, Inc., and Pisces International B.V., which give rise to two new products, MSC/PROBE and MSC/PISCES. I will get into more of the product description in the next section of my talk.

The organizational restructuring to meet our broadening technical challenges is also reflected in changes to our marketing organizations.

THE MSC PRODUCT FAMILY

One major change in recent years is that MSC is now a multi-product company. MSC/NASTRAN will continue to be our major product for the foreseeable future. MSC/NASTRAN enjoys a well-recognized position of leadership as measured from virtually every aspect - world presence, penetration of major corporations and government organizations, revenue production, and technological achievements. Our reinvestment policy helps assure retention of this leadership position especially as our clients take advantage of our recent offerings in design optimization, nonlinear mechanics and workstation products. Our commitment to improved heat transfer capability is but another example of our determination to increase our customer base and revenues.

Version 66 was delivered on DEC's VAX/VMS in January 1989. Since then we have released versions running on the IBM MVS/XA (both scalar and vector), the CRAY X-MP with both COS and UNICOS, and CDC's NOS/VE (both scalar and vector). A primary thrust with Version 66 was to assure compatibility with the anticipated computer systems of the future. This required a major overhaul of our Executive System and measurable improvements in data management.

We now offer more than thirty (30) unique versions of MSC/NASTRAN across our clients spectrum of installed hardware and operating systems.

The greatest single capability addition to MSC/NASTRAN in Version 66 is Design Optimization. Over the years we have built a solid base for this with our on-going development of Design Sensitivity Analysis. We believe that our current design optimization capability is in a class by itself because of the unique ability to isolate selected portions of a candidate design for intensified improvement with careful usage of key computer resources. Consistent with our past efforts we will continue to make further improvements in the capabilities and performance of design optimization - especially as we gather feedback from our clients.

Version 67 is well along the development cycle and we expect to lock up the code within the next six (6) months. Version 67 will have a more robust New Executive System and Shape Sensitivity. You will also see further advances in our exploitation of parallel processors and in nonlinear analysis. Significant improvements in acoustics analysis will be available as will a new TRIAR element. Other features include an indefinite matrix solver, machine-to-machine database transfer, and an improved view module for heat transfer analysis. At the same time we will be offering significant improvements in our documentation.

Thanks to our investments in MSC/ACCESS, MSC/NASTRAN is now fully integrated into the CADAM and Intergraph CAD/CAM environments. Further improvements are under way in our coupling with CAD/CAM products from Matra Datavision, PDA, Dassault and SDRC.

We have already begun development on a number of enhancements for Version 68 and beyond. We are making substantial improvements in such areas as heat transfer, a solid composite element, Component Mode Synthesis, superelement technology, shape, dynamic, and aerodynamic optimization and a viscous fluid element. Version 68 will offer further improvements over earlier versions in design optimization, externalization of error messages, improved numerical error diagnostics and nonlinear analysis.

Our research efforts will continue in parallel processing. We believe that our current game plan for supporting moderately parallel computers having up to 64 processors tracks nicely with product availability plans by major computer hardware suppliers. We continue to research massively parallel machines having more than 1,000 processors but we do not, as yet, have any specific plans for modifying MSC/NASTRAN to operate effectively on such types of computers. A number of clients have found success in such parallel environments by using each individual parallel processor as a quasi stand-alone processor working on a particular superelement. This certainly makes sense in view of the challenges of coping with synchronization problems.

MSC/XL, our recently introduced graphics pre- and postprocessor, was designed to serve as a broad-based user interface vehicle for a broad range of engineering applications.

MSC/XL is already in production use in conjunction with both MSC/NASTRAN and MSC/EMAS. We plan to systematically incorporate MSC/XL into all of our product offerings, as well as to continue porting MSC/XL to run on various platforms and graphics devices consistent with our clients' needs.

MSC/DYNA is MSC's adaptation of DYNA3D, a public-domain software product from Lawrence Livermore National Laboratories. Our initial

development work was done in Detroit, Michigan and subsequently transferred to Los Angeles. Our targeted markets include the automotive industry's crash analysis and the aircraft industry's impact studies. From the beginning we've set out to offer a reliable, well-documented software product whose input is compatible with that of MSC/NASTRAN.

MSC/EMAS, our recently completed electromagnetic analysis software product, enables us to both complement MSC/NASTRAN in selected applications and, more importantly, to compete more forcefully in a new market sector, the electrical and electronic industries. MSC/EMAS was developed in Milwaukee by the team from CAD COMP Inc., which we acquired from A. O Smith Corporation in December 1987. Shortly after becoming a part of the MSC family, E/EAD, as it is now called, took on the responsibility of incorporating their know-how in electromagnetic analysis into a stripped-down tool-kit version of MSC/NASTRAN. MSC/EMAS, including MSC/XL, was delivered as a production system in October 1989 according to a schedule the E/EAD people committed to eighteen months earlier.

With MSC's acquisition of Noetic Technologies, Inc., in November 1989, we added MSC/PROBE to our family of products. Based on p-version FEA methodology, MSC/PROBE offers detailed stress analysis capability with a unique user control over the accuracy of analytical results. MSC/PROBE complements MSC/NASTRAN in selected applications and allows MSC to better support the earliest phases of product development and provide a relatively smooth transition into detailed design.

The acquisition of Pisces International B.V., in Gouda, The Netherlands has provided MSC with both software (MSC/PISCES) and a strong European development and consulting base. The software provides proven problem-solving capability for high-speed, coupled fluid-structure calculations. The combination of MSC/DYNA and MSC/PISCES serves to solve extremely challenging problems which entail transient dynamics response of fluids, solids and structures undergoing high-velocity impact or high-amplitude pressure loadings.

Those of you that attended our Specialist's Technical Forum had the opportunity to get into more specifics - especially with regard to MSC/NASTRAN. The other products will be discussed in more detail over the next two days.

FUTURE THRUSTS

MSC's plans for the future must certainly be relatively easy for all of you to forecast based on our traditional practices as well as our recent developments and acquisition activities.

We will continue to improve and enhance our existing product line. We plan to systematically provide better interfaces and eventual integration of our various software products where it makes sense to do so.

Earlier this year, in January, we held a Technology Conference in which our key developers from around the world discussed their respective products and areas of expertise. This enabled us to gain better insight into our overall set of capabilities - especially in identifying complementary opportunities as well as selected cases of product overlap. We intend to emphasize the role of MSC/XL in providing a common pathway into our various products. We have initiated a substantial database management study to enable us to identify the key common data elements across our product lines.

Considering the extensive problem solving capability traditionally associated with MSC/NASTRAN, along with our recent development and acquisition efforts, I believe it is fair to say that MSC offers the broadest analysis capabilities to be found in any single organization around the world. I believe that this also serves to demonstrate very forcefully our clear-cut commitment to providing our clients with problem solving capabilities to meet today's needs and those to be encountered in your own product development environments in the future.

I believe that our current product offerings map very nicely into what many refer to as "concurrent" engineering but, more importantly, our close association with you, our valued clients, gives us the opportunity to gain direct feedback on areas where we simply have to do a better job. I have traditionally used this opening talk at our Users Conferences around the world to implore you to let us know how we can improve our software products and other support areas so as to make sure that we are fully supportive of your product development needs.

We will continue to work cooperatively with our complementary partners to effect the tightest possible coupling between and among our respective software and hardware products. We have striven hard to maintain a policy of evenhandedness, especially in our dealings with computer hardware companies. We will continue to do our level best to offer you the full range of capabilities and top notch overall performance on those computer systems that you are most likely to select for your highly diversified problem solving needs. We continue to develop and maintain close working relationships with the highest levels of management in other hardware and software companies to get the maximum amount of attention and support - especially when difficulties arise.

We will continue our global diversification. For many of you here this is an absolute necessity because of the geographic distribution of your respective companies but I believe that all of our clients benefit from such diversification. It

forces MSC to continually pay attention to the quality and robustness of our software products and to the clarity, accuracy, formatting, and media base for our documentation. It certainly improves my comfort level to know that engineers and other technical people are obtaining useful and accurate results from our software - and we all know that every extra "pair of eyes" on the lookout for potential errors in our code or documentation serves to further improve our quality.

We also do our very best to maintain visibility over the capabilities and initiatives of our competitors. Our cooperative efforts with university and research laboratories gives us valuable insight into emerging technologies to help us best determine when and how to implement new features and capabilities. This also serves to give us better insight into developments taking place in technical disciplines in which we are currently not offering a competitive product.

Finally, I would like to express my thanks to those of you who have put so much effort into the formation of the User's Advisory Committee. I can't tell you how pleased I was to sit down with the ringleaders of this new organization just about one year ago - towards the conclusion of last year's World Users Conference. Those of you that don't know me too well were probably skeptical of MSC's commitment to support this organization. For those of you that had doubts, I am sure they were all dispelled once you saw how the Specialist's Technical Forum ran under the leadership of this outstanding group.

You will hear more about this later on but I want you to pay particular attention to the breadth of technical and industrial diversification represented at this meeting. Now it is up to MSC to continue to support their initiatives and to further that cause by encouraging the creation of similar groups in our other global areas of presence.