**UNITED STATES OF AMERICA**
**BEFORE THE FEDERAL TRADE COMMISSION**

| | | |
|---|---|---|
| **IN THE MATTER OF** | ) | **PUBLIC VERSION** |
| **MSC.SOFTWARE CORPORATION,** | ) | Docket No. 9299 |
| a corporation. | ) | |

# MSC.SOFTWARE CORPORATION'S PROPOSED FINDINGS OF FACT

KIRKLAND & ELLIS
655 15th Street, N.W., 12th Floor
Washington, DC 20005
(202) 879-5000 (Phone)
(202) 879-5200 (Facsimile)

***Counsel for Respondent***
***MSC.Software Corporation***

Dated: June 28, 2002

## TABLE OF CONTENTS

## INTRODUCTION

As explained in MSC.Software Corporation's Pretrial Brief and Proposed Conclusions of Law, the Complaint in this matter should be dismissed.

The following Proposed Findings of Fact confirm that fact and preview the expected evidence at trial that:

(1) Complaint Counsel has failed to present the reliable hard facts required to establish a credible, competitively realistic product market;

(2) The product markets alleged in the Complaint (an "Advanced Nastran" and a "broader" "Advanced Linear Structural Finite Element Analysis ("FEA") Solver" market) are not recognized by industry participants or observers, ignore fundamental and evolving market realities and exclude numerous, reasonable substitutes;

(3) Complaint Counsel has failed to present substantial, reliable evidence of any actual sustained adverse competitive effects from MSC's acquisition of UAI for million in June of 1999 or MSC's acquisition of CSA for million in November of 1999, now nearly three years ago;

(4) Complaint Counsel has similarly failed to present sufficient evidence to prove any likelihood, let alone a reasonable probability, that MSC will any time in the foreseeable future substantially lessen competition, in any line of commerce, anywhere;

(5) Entry into and expansion within any "Advanced Nastran" or "Advanced Linear Structural FEA" market is easy at the de minimis and declining scale of UAI ( million in 1999 "Advanced Nastran" revenues) and CSA ( million), and would be sufficiently timely, likely and profitable to prevent any effort by MSC to raise MSC.Nastran prices for a sustained period of time – even at a small, but significant level – or otherwise attempt to substantially lessen competition, in any line of commerce, anywhere;

(6) MSC's actual and potential customers in the automotive and aerospace industries are predominately large, sophisticated purchasers of engineering software and services, readily capable of and willing to facilitate entry and expansion of competing FEA software providers and otherwise make credible threats to switch sufficient portions of their usages of MSC.Nastran and other related MSC products and services, to one or more of MSC's competitors, so as to render unprofitable any effort by MSC to raise MSC.Nastran prices for a sustained period of time – even at a small, but significant level – or otherwise attempt to substantially lessen competition, in any line of commerce, anywhere;

(7) MSC has utilized the assets it obtained from UAI and CSA – principally, teams of FEA developers, knowledgeable about the needs for and demands of aerospace and automotive industry customers – to provide better quality FEA products, technical support and customer services, at lower prices than MSC would have been able to provide but for the acquisitions;

(8) The competition that MSC faces for its MSC.Nastran product today in 2002 is substantially greater than the competition that MSC faced before the acquisitions of UAI and CSA in 1999;

(9) The remedies proposed by Complaint Counsel are punitive, will deter innovation by MSC and others, and are otherwise likely to substantially lessen competition among FEA solver suppliers; and

(10) The remedies proposed by Complaint Counsel are unnecessary and, in any event, far less draconian but adequate relief options are available to restore the de minimis and declining level of competition provided by UAI or CSA as of the time of their acquisitions by MSC.

## I. OVERVIEW OF FACTS DEMONSTRATING NO POST-MERGER "SUBSTANTIAL LESSENING OF COMPETITION."

1. UAI and CSA were troubled firms, annoyances to MSC at best, but certainly not substantial competitors, separately or collectively. Their "Advanced Nastran" revenues of respectively million and million in 1999, combined was less than of MSC's $55 million revenues for its MSC.Nastran product in 1999. These de minimis levels of sales were declining as the market was evolving faster than UAI's and CSA's ability to keep up. Each had just lost major customers, with no targeted, likely replacements. Both had already developed plans – absent acquisition by MSC (the only perceived option for each of them) – to abandon the sale of FEA software.

2. UAI's and CSA's exits were inevitable. Given UAI's and CSA's limited revenues, they lacked the resources even to maintain their codes, let alone keep up with enhancements and integration with complementary software provided by other players in the dynamic, demanding market for mechanical computer aided engineering ("MCAE") software. Neither UAI nor CSA offered the full range of products needed to meet customer demand in an industry environment rapidly insisting on a "total solution." For example, MSC spent approximately $25 million per year

on development, a significant portion of which was devoted exclusively to MSC.Nastran development. CSA and UAI spent well less than a couple of million dollars per year on their codes. Even Complaint Counsel's own witnesses testified that this was not even sufficient to keep up with the changing hardware that runs the code, let alone compete for customers' ever-increasing and ever more complex computer-simulation needs. *See infra.* ¶¶ 87-92.

3. By March 1999, CSA (which had a business model of selling an MSC.Nastran "knock-off") had lost its largest customer, Ford, constituting nearly one-quarter (25%) of CSA's total CSA/Nastran revenues. The loss of Ford was devastating to CSA. Ford has sponsored CSA in the early 1990's. When it terminated CSA, Ford "jeopardized" CSA's reputation everywhere. Once Ford was out, CSA was left with less than a million in revenues from an eclectic group of mostly small accounts. Ford had funded Ford-specific development by CSA, and purchased relatively significant amounts of CSA (although Ford always had maintained much larger, unlimited use contracts with MSC). By 1999, Ford decided that the costs of supporting CSA/Nastran were too great, compared with its limited use by Ford engineers.

4. At the time MSC acquired CSA, CSA was "insolvent" according to Complaint Counsel's own financial expert, Greg Smith. CSA had no sales force and no ability to raise further working capital, let alone monies for expenditures for product maintenance and development. *See infra* ¶¶ 97-100.

5. UAI's prospects were also "troubled," according to Complaint Counsel's financial expert. UAI had a different strategy than CSA. Rather than provide an inferior MSC.Nastran "clone," UAI engaged in specialized customization to fill then-existing "gaps" in MSC.Nastran functionality. But, in 1998 and 1999, Lockheed Ft. Worth decided not to renew its contract with UAI, and others (such as McDonnell Douglas) were considering doing so. UAI was worried that Chrysler would drop it as well. UAI saw its profitability decline 50%. With no ability to raise further cash, UAI decided to sell to MSC or retrench to the status of software advisors and Information Technology specialists, thereby ending the sale of its UAI/Nastran FEA software. *See infra* ¶¶ 118-124.

6. MSC acquired UAI in June of 1999 and CSA in November of 1999. These acquisitions were valued at $ million and million respectively, far below the then Hart-Scott-

Rodino Act pre-merger notification filing threshold of $15 million. As with many organizations – and many decisions in general – there were multiple factors driving MSC's decisions to make these acquisitions. Most significantly, MSC sought to acquire the developers employed by UAI and CSA. The year 1999 was the height of the Internet bubble. Hiring and retaining well-qualified software programmers with engineering experience was difficult. It was even more difficult to hire experienced developers knowledgeable about the FEA demands of aerospace and automotive customers – much less those already located near MSC in Southern California. MSC's acquisitions provided UAI's and CSA's developers with a ready opportunity to use their skills and experience in a most productive manner. *See infra* ¶¶ 62-63.

7. The actual results of these acquisitions have been MSC's improved ability to meet customer demands through enhanced service, improved customization, better functionality and the ability to respond quickly to the evolving needs of the marketplace. In addition, these acquisitions provided MSC with access to some limited features contained in the UAI and CSA codes that MSC had not yet incorporated into its own code. *See infra* ¶¶ 368-71.

8. In December 1999, Complaint Counsel began investigating MSC's acquisitions of UAI and CSA. Apparently, the Commission was looking to make an example, as the HSR threshold was being increased to $50 million. The stated goal was to "send a message" that companies that acquire firms below the HSR threshold do so at their own peril. *See* RX 3069 ("In this matter the commission reaffirms its practice of pursuing acquisitions that harm consumers, even where the acquisition may not be reportable.... This practice is particularly important now because the thresholds for reporting were recently raised.") Complaint Counsel saw MSC – at the time, a relatively modest corporation with only $150 million in total revenues – as an easy target.

9. When MSC would not immediately agree to divest CSA and UAI, Complaint Counsel launched an investigation that lasted nearly 22 months, involved unknown numbers of investigatory interviews and Part II testimony; 22 MSC witnesses were examined; and MSC produced 395 boxes of documents and 127 CDs. Since the filing of the Complaint in this matter (October 9, 2001), after MSC's efforts to resolve this matter were unsuccessful – in part due to Complaint Counsel's interference – MSC has been punished by an unending and unconscionably burdensome stream of demands for MSC documents (over two million pages of documents have been produced at an

expense of over $1.7 million in copying and non-lawyer processing costs alone) and depositions of MSC personnel (over 22 have been taken). And MSC has been further burdened and harassed with a series of phantom witness lists from Complaint Counsel, threatening as late as April 16, to call over 89 witnesses, with 27 witnesses still remaining on Complaint Counsel's "final witness" list.

10. Notwithstanding Complaint Counsel's relentlessness, the core fact is that – after nearly three years of microscopic scrutiny, Complaint Counsel has come forth with ***no*** evidence that MSC has raised prices – at all – since it acquired UAI or CSA – let alone supracompetitively. Complaint Counsel has offered no quantitative evidence that prices have increased post-acquisition; no evidence of an across-the-board or systematic price increase on MSC.Nastran. Nor has Complaint Counsel proffered any evidence of a price increase to any particular class or type of customers. Nor is there any evidence that MSC systemically or consistently reduced its discounting post-acquisition.

11. Instead of offering hard evidence, Complaint Counsel cites isolated anecdotes about a few customers that are now paying more than they were in 1999. These stories ignore numerous dispositive facts, such as changes in customers' usage, differences in the products being purchased, and the numerous customers that have paid ***less*** post-acquisition. This evidence of post-acquisition price decreases and output enhancements – and the notable lack of credible, substantial evidence of a post-acquisition anticompetitive effect – refutes Complaint Counsel's allegations that MSC somehow acquired a monopoly as a result of these two trivial acquisitions. *See infra* ¶¶ 454, 456, 462, 475-76, 548, 590.

12. Proving a negative is always difficult. But in this case, it is even more so since Complaint Counsel's Proposed Findings of Fact and Pre-Hearing Brief are replete with rumor, speculation, supposition, and innuendo. While some MSC employees have admittedly believed some of these rumors at one time or another, they remain rumors, ***not market realities*** supported by evidence. For example, CSA did not constrain MSC's prices. MSC faced UAI and CSA only episodically and not on any across-the-board basis. On these sporadic occasions, the customers consistently concluded that the disadvantages and risks of switching to UAI and CSA vastly outweighed any perceived cost savings or unique functionality benefit. *See infra* ¶¶ 362-67.

13. MSC did not price in response to UAI and CSA prior to their acquisition, and did not raise prices post-acquisition. MSC's Executive Vice President, Kenneth Blakely, who is one of the primary people involved in setting MSC's prices, testified that "the only other competitor [he] looked at when [setting] prices was ANSYS. Not UAI. Not CSA. Nothing else." *See* K. Blakely I.H. Tr. at 128:7-9.[1]

14. As explained by Thomas Curry, MSC's former CEO (until 1998) there was no reason to price against UAI or CSA because their inability to obtain significant sales did not warrant a price response.

> "I didn't really think of the other Nastrans as much in the way of competition, with the particular exception of Ford.... [as noted, later lost by CSA] But in, all of these big customers, like General Motors, had this improve-the-process kind of orientation. And they knew [that] integration and consolidation ... wasn't going to happen with CSA or UAI. There was never any thought in my mind that those companies would be in a position to do that. They could go in and do niche things. We felt ... we were driving up our products.... The gap was getting bigger and bigger and bigger. And the customers were expecting more and more from us. They were encouraging this integration and to complete the thing. ***So I didn't really think in terms of those companies competing with us*** in situations like General Motors."

T. Curry Dep. Tr. at 178:16-179:13.

15. An MSC 1997 marketing plan show that MSC considered its competitors to include ANSYS, Marc, ABAQUS, SDRC and PTC. The plan never mentions CSA or UAI, let alone suggest that either UAI or CSA was MSC's "closest competition". RX 2954. Repeated MSC documents identify ANSYS as MSC's "#1" closest competitor. Industry analysts see ANSYS, SDRC, PTC and ABAQUS as MSC's competitors. Even in 1996, before CSA's collapse, it was not mentioned in industry reports. *See infra* ¶¶ 131, 135, 182, 193, 228, 250, 266, 275, 285, 293, 301, 315-22.

16. MSC's sales representatives uniformly testified that UAI and CSA had ***no*** impact on negotiated prices. For example, Mr. Hart testified that, in his eleven years of experience in MSC's sales organization, he was not aware of "anyplace that [MSC] lowered [its] price in direct response to [UAI's or CSA's] pricing." This was because "[w]e really didn't consider them a very viable

---

[1] MSC respectfully submits as an attachment hereto an alphabetical listing (organized by last name for individuals) identifying the various individuals and organizations mentioned in MSC's pretrial submission. Exhibit 1 hereto.

competit[or] nor alternative." B. Hart Dep. Tr. at 270:21-271:11. Mr. Dyer, who has oversight responsibility for most of the major aerospace companies, including Boeing and Lockheed, testified that CSA and UAI were "not competitive products in my market place. They [didn't] compete ... So I basically [felt] no price pressure in my marketplace in my accounts from UAI and CSA products." R. Dyer I.H. Tr. at 106:15-24.[2]

17. Immediately after MSC's acquisition of CSA and ***before*** the FTC initiated its investigation, MSC's internal documents outlined its future pricing strategy. In those documents, MSC made clear that it had ***no intention*** of raising prices. RX 766. Nor has MSC deviated from this strategy in the nearly three years since the acquisitions.[3]

18.

19. Complaint Counsel has tried to use its expert, Dr. Hilke, to bootstrap into evidence a few anecdotes to argue that MSC raised prices post-acquisition. Notably this limited material relates to those few customers that were using UAI and CSA pre-acquisition. In many of those

[2] *See also* R. Dyer I.H. Tr. at 125:3-11. ("The whole point to that is this: They weren't competitive and they couldn't compete. Now, I end the point that I was not willing nor would I be willing to try to cut prices to inflict damage or harm on CSA or UAI. I did not have a need to do that because the products were different. [M]y main competition in my accounts are the ABAQUS's and the ANSYS's. It has never been UAI or CSA/Nastran, ever.").

[3] *See, e.g.*, R. Dyer I.H. Tr. at 85:24-86:2 ("I think I did make the statement that except for the ***[pre-acquisition]*** 4 percent price increase ... that MSC had not raised their prices."); *see also* RX 1146; RX 2349 (***pre***-acquisition e-mail explaining prices are being increased "Worldwide and for all products" by four percent to "account for inflation and . . . increased capabilities); W. Torres Dep. Tr. at 151:24-152:16 ("Q. Have you raised prices for MSC.Nastran since the acquisition of CAS or UAI? A. No."). In addition to this pre-acquisition ***list*** price increase, MSC subsequently changed the price of its tokens from $100 each to $105 each, to reconcile the pre-acquisition per-seat price change, with its token system. Significantly, these price changes apply ***across all MSC products*** and were not limited to MSC.Nastran.

instances, MSC renewed the UAI or CSA contracts at the existing UAI or CSA rate or sold them the higher quality MSC.Nastran at a discount. *See infra* ¶¶ 590.[4]

20. Not all UAI or CSA customers paid more post-acquisition. For example, at and the customers had access to MSC.Nastran at substantially lower prices post-acquisition than they were paying for either UAI or CSA pre-acquisition.[5] *See infra* ¶¶ 454, 462, 488-89.

21. In short, the evidence at trial will show that customers are not paying more for MSC.Nastran as a result of MSC's acquisitions of UAI and CSA.

---

[4] Complaint Counsel points to MSC's decision to offer paid-up licenses as an example of ***post***-acquisition anticompetitive conduct. *See* Compl. Counsel's Pretrial Br. at 27-28. But ***the whole paid-up issue is a red-herring***. Just like virtually every other software company, MSC decided – very early on to offer its software to customers on a paid-up basis. That decision was in no way connected to MSC's acquisitions of UAI and CSA. Significantly, MSC was one of the few companies that had continued to provide annual leases. MSC has provided customers with an incentive to switch from annual leases to paid-up licenses, by ensuring that the price of a paid up license is *lower* than the lease price on a net present value basis. *See, e.g.,* RX 2306 ("Analysis [of] your annual token lease vs. one time paid-up purchase shows that the amount paid for leased tokens . . . is the same amount as for paid up tokens" over a three year time frame.) And ***customers can still lease MSC's products*** on an annual basis.

[5] cost for Nastran-based solvers after the acquisitions. Pre-acquisition, was paying million for an unlimited use MSC.Nastran license, and for UAI/Nastran. Post-acquisition, continued to pay MSC $1.2 million for MSC.Nastran, but only $100,000 for continued use of UAI/Nastran. *See* RX 2405.

chose not to convert to MSC.Nastran from CSA/Nastran. But that decision was based on the costs of switching from CSA to MSC. Rather than pay those costs, chose to stay with CSA post-acquisition. Significantly, was covered by which is ***an unlimited use*** agreement, meaning that the cost of the MSC software was substantially below CSA's software cost, and that it could have switched from MSC to CSA essentially for free. The fact that did not do so demonstrates the fallacy of Complaint Counsel's assertion that switching between MSC and CSA was seamless. K. Barthenheier Dep. Tr. at 82:25-84:17, 173:10-177:20, 241:20-248:9.

22. Complaint Counsel's claims of anticompetitive effects are ultimately premised on presumptions from its "I know it when I see it" market definition. But Complaint Counsel's "advanced Nastran" market definition does not reflect market reality. Not a single identified trial witness has testified that they have ever used the term "Advanced Nastran market" prior to the FTC's investigation. Indeed, ***Complaint Counsel does not even know what the term means***. Complaint Counsel's definition of what constitutes "Advanced Nastran" has kept changing. The only constant has been Complaint Counsel's desire to define a market of only MSC, UAI, and CSA.

23. The testimony from a cross section of customers, competitors and industry observers – people with day-to-day knowledge of the actual market realities – will be that no one believes in the existence of an "Advanced Nastran" only market.[6] Some users genuinely love MSC.Nastran and would not switch their FEA solver usage in response to a 5 or 10% price increase. But these ***inframarginal*** users suggest an "MSC.Nastran market," not an "Advanced Nastran market." The many ***marginal*** users allow numerous opportunities for ***partial switching*** to alternative FEA solvers if MSC prices supracompetitively. *See infra* ¶¶ 315-22.

24. This is especially true since there are many other FEA solvers that can do most of the work that MSC.Nastran can do and that offer their own competitive advantages. These solvers – and MSC's actual and potential customers' willingness and ability credibly to threaten to switch to them – collectively constrain MSC's (and the other companies') ability to raise prices above competitive levels. *See infra* ¶¶ 139-349.

25. ANSYS, for example, can not only solve the same engineering problems as MSC, but it also offers customers an integrated platform for advanced computer simulation. For these reasons, ANSYS believes that it can "dominate" computer simulation (which is what these tools are really all about), and overtake its "primary competitor," MSC. Because there is such great competition to become a customer's preferred vendor of computer simulation tools (including FEA solvers),

---

[6] The sole exception is MSC's "#1 Competitor" ANSYS – which does so in express contradiction of its internal documents, presentations to customers and public statements – as part of its obvious strategy to raise its rivals' costs, divert MSC's revenues and human resources away from product development and other competition with ANSYS, all as part of its "partnership" with Complaint Counsel in this matter. *See infra* ¶¶ 135-73.

26. Other competitors, such as Dassault, also provide a significant competitive constraint on MSC. For example, in the aerospace segment of the market, ELFINI is used prominently at Boeing. Other aerospace companies, such as Cessna, also consider ELFINI to be a close substitute for MSC.Nastran. In the automotive segment, Honda also uses ELFINI to perform the same types of analysis that is performed using MSC at other automotive companies. Dassault also has the leading CAD platform, Catia, which is well-used throughout the automotive industry. And there are a number of other vendors of FEA solver technology, including HKS/ABAQUS, ANSYS, and LMS that operate on the Catia architecture.

27. Complaint Counsel admits that ANSYS and Dassault compete with MSC in an "advanced linear FEA solver" market. Again – no identified trial witness has testified to any industry recognition of such a narrow "market." Yet, the industry participants recognize and utilize many other FEA solvers that also do what Complaint Counsel – sometimes – describes as "advanced linear" analysis. These include, in addition to ANSYS and Dassault, HKS' ABAQUS, Permas, SDRC's Ideas, Internal Codes, Cosmos, NE/Nastran, PTC's Mechanica, Algor, Altair, MI/Nastran, and NISA. Each of these FEA solvers collectively and individually effectively constrain MSC (and each other) from pricing supracompetitively. *See infra* ¶¶ 131-356.

28. Complaint Counsel and Dr. Hilke attempt to move to ABAQUS out of the relevant market because of ABAQUS' recognized leadership position in non-linear analysis; but this narrow-minded view simply ignores the plain fact – recognized by MSC, HKS and their customers – that ABAQUS has extremely robust linear capabilities which can fully or partially replace MSC.Nastran. In fact,

29. Among some small customers, where UAI and CSA were viewed as potential vendors in 1999, many competitive vendors were (and are) present. NE/Nastran, for example, continues to provide a low-cost Nastran-compatible solver. Significantly, NE/Nastran's sales have been growing at an exponential rate since MSC's acquisitions of UAI and CSA.

30. ANSYS has teamed up with Richard MacNeal (the co-founder of MSC) and Harry Schaeffer (one of MSC's former lead developers) to offer AI*Nastran, a Nastran-based code, projected to be superior to anything CSA or UAI had and eventually to be a "Superior" to MSC.Nastran. ANSYS projects that it will – within two (2) years and without any evidence of a supracompetitive price increase – have In addition, AI*Nastran will be sold as part of ANSYS' efforts to provide customers with a total solution to their engineering needs. AI*Nastran will be integrated with ANSYS' other products and sold with the development and world-wide sales support of ANSYS, a company with revenues of $85 million, growing and projected to continue growing at a compound 12.3% rate. *See infra* ¶¶ 186-196.

31. Beyond ANSYS' AI*Nastran, there are other new entrants and others capable of (and already) expanding their sales to the very automotive and aerospace customers (General Motors, Ford, Chrysler, Boeing, Lockheed, TRW, NASA and The Department of Defense) Complaint Counsel fear for. Yet each is a sophisticated engineering software knowledgeable, power buyer. ABAQUS, Permas, LS-Dyna, CDH, Vanderplaats, NE/Nastran and other solvers are all in use or under consideration at those very customers today.

32. In sum, as demonstrated in detail hereafter, there is no evidence of any post-merger anticompetitive effects despite the passage of nearly three years.

## II. MSC's ROLE IN THE COMPUTER-AIDED ENGINEERING MARKETPLACE.

### A. FEA Analysis, As Well As All Computer-Aided Engineering, Is Designed With One Over-Arching Goal In Mind – To Solve Real-World Problems By Simulating Reality.

33. Customers who use finite element technology do so in the course of their product development processes. The characteristics of these product development processes are driven by one ultimate objective: reducing the time and cost of product development. For many years, companies have recognized that computers help achieve that goal. As MSC's internal documents explain, "our basic concept is that manufacturers must use computers and software to simulate the performance and manufacturability of their products and that we are in position to help them with

design simulations."[7] In short, manufacturers need "computing infrastructure and applications" that allow them to "start" replacing "simulations [with] physical prototypes."[8] Optimally, computer simulation should permit a company to design, analyze, and simulate the performance of a new product in as part of an integrated process.

34. But simulating reality is a tall order, and while much progress has been made much more remains to be done. For this reason, analysts and industry participants have recognized that the computer simulation market is in the midst of a dramatic technology transition, with dynamic and accelerating change in the competitive landscape.[9]

35. As Dr. Kenneth J. Versprille, an industry expert with over 25 years of experience in the development and use of CAD and CAE technology, has observed, "the entire CAD/CAE industry is undergoing ***radical transformation***." Versprille Expert Report ¶ 24. Dr.Versprille has observed that there is a general trend in the CAD/CAE industry towards focusing on the entire ***"Product Lifecycle"*** as opposed to simply focusing on the FEA solver, which represents just one link in the long product lifecycle chain. This trend has several related aspects. First, there is a trend towards ***integrating products***, which includes, among other things, vendor consolidation, vendor alignment, and improved interoperability among and within vendor software. The ultimate goal is to create a "***fully digital validation environment***." Second, there is a trend toward ***moving analysis to the front-end of the design process*** by having designers perform more and more of the work previously reserved for the so-called "professional analyst." Simultaneously, cheaper, faster computers have increased the ability of manufacturers to deploy CAE solutions and created a huge ***demand for PC-***

---

[7] *See* RX 767; T. Curry Dep. Tr. at 54:4-12 ("every company that has something to offer has to have a value proposition. And our value proposition is that if you use our products you can go faster and make less mistakes and get your products to market sooner.").

[8] *See* RX 2391; *see also* RX 806. ("Historically, much of the analysis work has been performed after a concept vehicle has been designed and the drawings are available for the analyst. Currently, efforts are underway to drive the analysis upstream so that it guides the concept design before the first lines are laid.").

[9] *See, e.g.,* K. Versprille Expert Report ¶ 24; *see also* RX 2312 ("[A] key thesis of ours has been there are critical evolutionary changes underway . . . that will again enlarge and broaden the value or role of engineering and design as competitive tools."); *Id.* at 89 ("This industry, formerly called "CAD/CAM, CAE" is in a dramatic transition with respect to market focus . . . customer benefits . . . scope of its products . . . and underlying technology.").

***based solutions***, while the demand for UNIX-based solutions has decreased. Clearly, CAE companies today must have tremendous resources – including both human and financial capital – to meet these trends.

36. Prior to the 1970s, virtually all product development went through a series of independent steps. First, the company would create a design. As part of this design process, engineers would create detailed drawings, and perform some engineering calculations (primarily using a calculator) to determine if the design could withstand expected stresses.[10] Second, the company would build a prototype from the design and would subject the prototype to physical, and sometimes destructive, tests. Flaws that were uncovered in the testing phase would then be fixed in the next design iteration.

37. Beginning in the 1970's, a number of finite element solvers became commercially available. RX 117. As Dick MacNeal, founder of MSC, explained, the concept of finite element analysis began when a team of Boeing Aircraft researchers published a paper demonstrating that "surfaces with complex shapes could be analyzed by subdividing them into ... [smaller] elements," hence the term "finite element analysis."[11] Today, all FEA solvers are based on this same fundamental mathematical theory, and all are designed to achieve a common objective: solving mathematical physics problems, which are designed to mimic real-world phenomena.

38. In the early days of FEA analysis, "simulation" meant nothing more than "solving" a vast number of equations to yield mathematical "answers" regarding how an idealized structure would perform under various conditions. Indeed, in the early '70s, when the power of computer-hardware and the sophistication of early finite element programs were in their infancy, the input and the output were printed on stacks of punch-cards (hence the term "decks"). As computers became

---

[10] Significantly, Keane Barthenheier testified that, when he worked at Boeing on the 737/757 programs (primarily on the interior of the aircraft) in the 1980's he used "mostly a calculator," since "a lot of the analysis at Boeing is still done as what we call classical analysis, which is closed formulation, which typically requires a calculator to solve those equations." *See* K. Barthenheier Dep. Tr. at 22:2-12.

[11] *See* RX 117. Specifically, FEA solvers work by breaking a complicated structure down into small "elements." These elements have geometric, physical, and mathematical properties. Elements, when "put together" (like bricks in a wall), will simulate how a real structure behaves when subjected to various physical forces.

more powerful and thousands of man-hours (the traditional measure of research & development effort) were put into enhancing the functionality and speed of FEA solvers and related software, customers' computer simulation needs became more sophisticated.

39. For this reason, FEA solvers, which were used primarily after the prototyping stage to determine why the prototype had failed the physical tests, were soon used in the pre-prototyping stage to determine whether a product could handle expected stresses.[12] But it also became apparent that FEA solvers could be used as the engine or driver of graphical computer-simulation, especially as computing power became exponentially more powerful and less expensive. In this way, design, analysis, and computer-aided testing could be integrated to create better designs prior to the first physical prototype.

40. Part of this effort to create better product designs involves expanding the ***types*** of analysis that can be done with computer-simulation software. The types of analysis that must be performed, of course, varies significantly within each industry.[13] Automotive customers, for example, are interested in crash analysis and noise, vibration, and harshness analysis (NVH). Aerospace customers are often interested in aeroelasticity analysis, as well as the physics associated with gas turbines (or jet engines). Thus, CAD and MCAE vendors must be able to provide their customer base with a broad range of software tools that can handle the multiplicity of engineering issues both within a specific industry and across multiple industries.

41. Today most of MSC's major competitors have significant overlap in core FEA solving functionality. And the differences among various FEA solvers has narrowed, and will continue to narrow, as major competitors continue to add more features and functionality. Versprille Rpt. at 23 (competition among vendors "has grown in recent years in part through expansion on reinforcement of CAI product lines either through internal development or acquisition.")[14] As MSC

---

[12] *See* RX 156 (noting the change from "sequential design process, consisting of design, analyze, build, tests, and fix, to "concurrent process," which involves design/analyze/test as a single step).

[13] *See, e.g.*, T. Curry Dep. Tr. at 65:10-17 ("the aerospace customer would have a process that might be different than the automotive process that might be different than the jet engine process or even the powertrain process within the automotive").

[14] Dr. Kenneth Versprille is Research Director for D.H. Brown Associates' Design Creation and Validation service. D.H. Brown Associates is a leading research and consulting firm that provides strategic analysis, assessment, and evaluation of technologies, products, and market trends in the

recognized at least as early as 1997, "[o]ur software competitors are not sitting still. Just as we have growth and replacement strategies, so do they." RX 771.

> "The features and functions and capabilities of the [FEA] codes will continue to be narrowed [and] ... the uniqueness of the codes will continue to be narrowed. [J]ust as ... MSC is trying to improve [its] nonlinear capability to compete more in the nonlinear arena with ANSYS and ABAQUS, ABAQUS is now in the process of trying to develop much more of the linear functionality and capability."[15]

42. But, as industry expert, Kenneth Versprille will explain, as FEA vendors increased their functionality over time, the market also began to rapidly evolve in many other ways, turning FEA solvers from mere advanced calculators to simulation engines. This change was marked primarily by the advent of first generation pre and post processors in the early to mid-1980's, which were designed to enhance a computer's ability to model a structure. Pre/post processors dramatically increased the size of the FEA solver market. Because pre/post processors contained a Graphical User Interface (Windows is a familiar GUI) and because they automated the previously time-consuming manual task of creating a finite element model, the number and types of users that could benefit from FEA analysis increased dramatically.[16]

---

information industry.

[15] R. Dyer I.H. Tr. at 116:7-15. *See also*

; K. Barthenheier Dep. Tr. at 13:8-14:13 ("it's a long list," which includes MSC/Nastran, MSC/MARC, Nastran for Windows, ANSYS, Dassault's ELFINI and GPS, SDRC, Algor, ABAQUS, COSMOS, MI/Nastran, NE/Nastran, SRAC, Stardyne, ATLAS, SAMECS."); R. Dyer I.H. Tr. at 38:25-39:7 ("So there are multitudes of codes available that have overlap in terms of capabilities that are applicable in aerospace, automotive, ... general use. You could use any of these codes for doing ... analysis on joints, for instance. So yes, there's overlap – all of the codes overlap."); K. Blakely I.H. Tr. at 287:22-288:2 ("There is tremendous overlap with all of these solvers, all of the forms of the element libraries ... I think ANSYS and everybody else has the same form elements.").

[16] As Jeff Morgan, UAI's CEO and President and now MSC's Vice President of Software and Business Development explained, "[t]oday's software systems are much easier to use than 20 years ago.... [T]raining, in years past, could have been extensive because of the nature of the software systems, the preparation of input data was a complex task. That task has been greatly simplified with newer software that's commonly called pre- and post-processor software. So now instead of typing instructions to a program such as Nastran, you use a mouse and draw the instructions." J. Morgan I.H. Tr. at 65:8-66:20.

43. Pre/post processors also turned the focus of attention away from the solver as a stand-alone piece of software, and have now become the engine that solved the mathematical equations that the pre/post processor creates.[17] Thus, the solver itself became mere plumbing.[18] As explained by Dr. Swami, the founder of CSA, "[t]he MCAE marketplace was becoming so much more open ... pre and postprocessing has started a greater impact and ***the engine or the solver doesn't matter*** ... the engineering company customer didn't care whether it's Nastran or ANSYS or ALGOR or COSMOS." Swami I.H. Tr. at 108:13-21.

44. In addition, most early pre/post processors were based on "open" architecture, which meant that they allowed customers to switch significant portions of their analysis from one solver to another, depending on factors such as availability, technical advantages and disadvantages, and, of course, price. *See, e.g.,*

This practice was facilitated by the fact that virtually every major customer of FEA software regularly uses and has access to multiple FEA tools.

45. Because pre/post processors opened up the world of finite element analysis, the impact on MSC was profound. As Mr. MacNeal, the founder of MSC (and now principal of SAS, ANSYS' partner for AI*Nastran) explained, in the early1980's, MSC "realized that it was becoming important to consider MSC/Nastran an analysis tool in a ***larger context*** which included the totality of computer-aided engineering and design beginning with Computer-Aided Design Drafting (CAD) and ending with the preparation of tapes for numerical parts programming, or Computer-Aided Manufacture (CAM). We conceived MSC's role in this context to encompass what is now called

---

[17] Swami I.H. Tr. at 108:13-16, 79:13-80:5 ("In the early days, there was no pre and post.... If you look ... in the '70s, there was no pre and post processor and we had to sit and do the keypunch and then that is so inefficient we could not even imagine how we did it in those days. ... [S]o at that time all the emphasis was on the solver because there was no pre and post. You developed the data yourselves, you keypunch them and all those things, so all the emphasis was on the solver and the solver code.... But now, the pre and post and the size of problems have become so big and the power of computers in the last five years, *the pre and post has now become dominant.*").

[18] In that regard, it is significant to note that the thing Microsoft most feared from Netscape and Java was the threat that its operating system would become mere plumbing and that other software would run on-top of some other software, such as Netscape's browser. *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001). Here, FEA solvers had been relegated to plumbing status by the early to mid 1990s, and were quickly becoming more commodity-like in nature.

Mechanical Computer-Aided Engineering (MCAE) which begins with geometry generated by a CAD system, prepares a finite element model, analyzes it, resizes it to meet design criteria, and prepares output for inspection by engineers and designers." RX 117.

46. Today, MSC recognizes that it is necessary to fit within the customers' existing, yet evolving, engineering processes. Thus, the factors that drive FEA vendor selection depend less on the functional similarities and differences among FEA solvers, and more on the vendor's ability to provide computer simulation technology and support.

> " So I think ... in the future that ... the products are going to have pretty much all the same features and functions, and the future of the market is not in the software but is in the application of the software and how it is used within companies, how it's merged into their processes, engineering and manufacturing processes, to improve their products. The key is not the software; the key is the application and use of the software."

*See* R. Dyer I.H. Tr. at 115:25-116:25.

47. Because of this rapidly evolving marketplace, there are three major customer requirements that FEA vendors must be able to address:

- ***Development of Enhanced Capabilities***. A successful FEA vendor must be able to provide greater depth and breadth of capability, meaning that CAE vendors must continually strive to simulate more and more of reality. What first started out as a need to analyze the strength of a steel beam (structural analysis), soon became the need to understand the vibration of the automobile (noise, vibration & harshness), and later became the need to simulate the performance of an entire vehicle on a virtual torture track.[19]

[19] T. Curry Dep. Tr. at 64:20-65:1 ("there's a whole spectrum of capabilities" and the goal "was to fill the gaps, kind of a technology road map . . . of where you're going with the products and tie all the pieces together."); *see, e.g.,* RX 806 ("Historically, much of the analysis work has been performed after a concept vehicle has been designed and the drawings are available for the analyst. Currently efforts are underway to drive the analysis upstream so that it guides the concept design before the first lines are laid. The performance of NVH, Durability, Crash, and Vehicle Dynamics Analysis at the concept stage is performed using more generic models that should capture only the basic performance characteristics .... The purpose [of this analysis] is to minimize risks during the concept design phase.").

> "[J]ust looking at some of the characteristics, looking at the complexity of what – the projects that we've been involved in, and some of the things that have been very productive for us the last couple of years is the ability to, for instance, build a ***truck*** and as opposed to saying, 'well is it stiff enough?,' ... 'how is the ride?,' but be able to build the complete vehicle, the suspension systems, and then ***actually simulate*** the terrain it's rolling over, and do the equivalent of what would normally be done at a ***torture track*** or ***proving ground***."

*See* RX 287.

- ***Integration***. A successful FEA vendor must have the resources to improve its interoperability with CAD systems, PLM systems, pre/post processors, and customers' other unique engineering processes.[20]

> "[i]t will be necessary to ***obliterate boundaries*** between sources of data involved in an analysis. After experiencing the inadequacy of so-called standards (by definition, a least common denominator approach), we have already witnessed new techniques for sharing geometric informative in native form between disparate applications. Expect more of this, but also the coupling of information from numerous sources: multiple suppliers, multiple CAD systems, orphan analysis models from previous designs, tables of performance data, etc. The ability to interchange these at will and construct comprehensive system models will become standard practice, and while I am not sure I would call it 'seamless,' the seams will be virtually undetectable to the user."[21] RX 260.

- ***Services***. An FEA vendor must be able to provide customers with the ability to provide substantial integration services. This is because each customers' need for

20

[21] Interestingly, the advantages of consolidation among CAD and CAE vendors was recognized at MSC as early as 1995, and included "smooth interface between design and analysis" as well as a "single source of supply." RX 173.

CAE tools differ. They differ because of the customers' industry, the nature of their specific products, and the specifics of the CAE tools they have historically used. As MSC's Vice President, Ken Blakely, testified, there is a "changing paradigm in the industry... . [C]ustomers are expecting service today. And I mean services, not as support, but as ***funded enhancements, as in training, as in developing customer systems for them***. Today's world is not about point solutions. It's about integration of a total solution into the customers' product development processes. That's where our services come in." *See* K. Blakely I.H. Tr. at 77-20-78:4.[22]

48. In short, companies offering FEA solving technology (either as their flagship product offering or a supplement to other CAD and CAE tools) today are competing to provide customers with a "***total solution***," either by themselves or with the assistance of a few select vendors.[23] As MSC's business plans recognize, analysis will need to be done far earlier in the process, and at an ever faster rate, than it is today. This will be accomplished in part by empowering designers to do more simulation ... and in part by integrating sub-processes and streamlining data flow. Detailed stress analysis, today at the 'back-end' of the process, will be more closely linked to external loads generation, reducing overall time and cost." RX 771. As MSC's business plans recognized, "customers are generally looking for more complete solutions; a single supplier who will tie into their CAD and PDM systems as well as integrate various analysis codes together." RX 767. R. Barclay Dep. Tr. at 80:11-21 (noting that competitors are seeking to provide customers "***total solutions***," which requires competitors to have is "the ability to offer an integrated suite of tools ...

---

[22] This is not a litigation driven realization. Ken Blakely, in his ***1997*** Aerospace plan, recognized that "[o]ptimizing the design-to-certification process represents [MSC's] primary aerospace opportunity. We will do this by working closely with out important customers and emphasizing the ***totality of our aerospace solutions*** (strategies, software, services). Strategies are formulated to ensure that people are using the best processes. We work with our key customers to set up engineering process strategies that involve engineering process audits and joint development and customization of software, including potential commercialization. . . Software automates the processes. Services ensure that the software is utilized effectively." RX 771.

[23] *See also, e.g.,* RX 767 ("Process oriented customers are generally looking for more ***complete solutions***; a single supplier who will tie into their CAD and PDM systems as well as integrate various analysis codes together."); RX 156 (noting the need to "enable effective CAD/CAM/CAE integration" where software partners provide "best-in-class" solutions).

includ[ing] drafting, design, ... analysis, and manufacturing modules that were integrated through a common interface.").

### B. In Evolving Markets, Those That Adapt Like MSC Thrive. Those That Stagnate, Like CSA and UAI, Die.

49. As ANSYS' 2001 Annual Report cogently observes, "[i]n nature, evolution is dependent upon a species' ability to adapt to a changing environment. It is this adaptability which ensures the long-term survival of any entity." RX 284.

50. Because the "competitive landscape [was] changing rapidly," there has been tremendous pressure on vendors of FEA and MCAE technologies to grow and adapt with the changing times. As MSC recognized early on, there is a "paradigm shift" occurring in the CAE market due to the benefits of increased "simulation" driven design. *See* RX 2119. The result of this paradigm shift is that "many small niche players ... will have difficulty in surviving." RX 2119. Not surprisingly, as small "point solution" vendors, UAI and CSA were becoming obsolete. Indeed, beginning at least as early as 1995, the technological gap between MSC and either UAI or CSA started growing exponentially.[24]

#### 1. From The Birth of FEA Analysis, MSC Has Dedicated Itself To Improving Computer Simulation.

##### a. The Richard MacNeal Era.

51. Richard MacNeal was the founder of MSC. He was a principal architect of the initial Cosmic Nastran code. As Tom Curry explained, he was a "technologist," a "mathematician," and he "invented this technology.... [H]e saw ... there were problems to be solved [and] he figured out how to solve them.... [Then] he spent the first twenty years of the business introducing that technology and helping customers learn how to use it." T. Curry. Dep. Tr. at 60:15-24.

---

[24] *See* R. Louwers Dep. Tr. at 171:19-172:18 ("the capabilities that are in MSC/Nastran say after ... 1995, have greatly improved as a consequence of technical requirements coming from our customers, and we have, as a consequence, greatly outpaced the technical capabilities of many of our competitors, including UAI and CSA/Nastran, as a consequence of that investment in research and development [in] enhancing the product.").

52. For Dr. MacNeal, it all began in December 1965, when he won the contract to develop Nastran from NASA. For a number of years, he and his company, MSC, continued to develop and maintain Nastran for NASA.

53. By 1973, Dr. MacNeal took the code he had developed and began offering it commercially to the public. As he explains in his book, by 1973, "it became crystal clear that we owed no further loyalty to NASA and that our proprietary version of Nastran would hence forth diverge rapidly from the official version as new capabilities were accumulated." RX 117.

54. As early as 1974, MSC "began in earnest to add new capability to MSC/Nastran and by the end of 1975, [MSC had] compiled a long list of improvements that placed MSC/Nastran well ahead of the ... [then] current Cosmic Nastran release." A report prepared in March 1976, demonstrated that only 380 out of MSC.Nastran's 1,408 subroutines remained unchanged from Cosmic Nastran. *Id.* Another indication of the level of activity was that the number of subroutines had increased by fully 50% from the initial Cosmic Nastran release. *Id.*

55. MSC, however, was not the only company offering FEA solvers. As Dr. MacNeal explained, as early as "1974, [MSC] gradually became aware of increasing competition from other finite element programs." Indeed, "three important finite element programs were introduced in the United States in the same year as Nastran. They were ANSYS ..., MARC ..., and the SAP program.... ***Over the years, the ANSYS program has become our strongest competitor.***" *Id.*

56. By the late 1980's and early 1990's, ANSYS had developed its own pre/post processor. By that time, it became abundantly clear to MSC that pre/post processing was the future and that FEA solving technology was moving into the background. It also became apparent that, in order for an FEA solver to survive competitively, it would be necessary to partner with a strong pre/post processor. Thus, in 1994, MSC acquired PDA, the developer of PATRAN.[25]

[25] Patran was a pre/post processor that was initially designed to work with MSC.Nastran, but it was quickly decided that Patran should support the major other FEA solvers, such as ANSYS, Marc, and ABAQUS. Ever since the acquisition of PDA, MSC has devoted significant resources to improving the integration between PATRAN and MSC.Nastran. *See* F. Perna Dep. Tr. at 81:5-25 ("so one of the things that I did very early on [is] I kicked off a project called Thunder, which is a very pragmatic tighter integration between NASTRAN and PATRAN.").

57. One of the most significant things that resulted from MSC's acquisition of PDA was the change in MSC's management. At the time of the PDA acquisition, MSC was run by Dr. MacNeal. Within a year after joining MSC, however, Dr. MacNeal resigned his position as a member of management, and Tom Curry took over the top post at MSC.

**b. The Tom Curry Era.**

58. Prior to MSC's acquisition of PDA, MSC was primarily a technology-focused company. In fact most FEA solvers were primarily technology-focused. They were, without exception, private companies run by technologists that were interested in developing "cool" technology for the intellectual challenge, rather than to satisfy specific customer demands or positively impact customers' "return on investment."

59. Over time, the leading companies, such as ANSYS and MSC, went public and devoted themselves towards understanding and satisfying customers' specific computer simulation needs. As Tom Curry explained, by the mid-1990's, the age of evangelizing the benefits of FEA solvers were long past; customers were ready for the next step in the evolution of computer simulation:

> "[E]ventually the customers became very good at using [FEA technology] and made it a more integral part of their process, and their objectives moved on. It was a stand-alone tool at one time, and then after twenty years or whatever of absorbing it, they got to the point where they really wanted to do other things, and so it was the listening to the customer about those other things and turning the company to address those other things that [made MSC] market driven."

T. Curry Dep. Tr. at 60:25-61:8.

60. Thus, when Mr. Curry joined MSC (originally having come from PDA), his primary goal was "to move the company's orientation from one of developing technology and looking for a market to one of being market-driven in the sense that we would try to really understand what the customers were trying to do and then adapt our products to that and our service and support and everything to [do] that." T. Curry Dep. Tr. at 60:1-6.

61. In fact, by 1996, it became apparent that MSC's future – and the future of FEA solvers in general – rested with the solver's ability to become the primary engine for customers' computer simulation requirements. Thus, MSC repositioned itself in 1996 to focus more on

customers' computer engineering processes (which obviously included increased dependence on computer simulation tools, and ultimately FEA solvers).[26]

62. MSC believed that "customers no longer wanted to be responsible for acquiring literally dozens of stand-alone tools from multiple sources, ... and taking responsibility themselves to integrate them all together into a viable process." MSC saw that there was "a market opportunity to do the integration, be specific to [customers'] problems and ... grow the business that way." To do this, MSC realized that it would have to be able to provide not only FEA software but application software, advice on computing strategies, integration with other, related software systems (CAD, CAE, and PDM) and automation of processes. T. Curry Dep. Tr. at 63:23-64:12; RX 767. In short, MSC believed that, in the future, it had to find a way "to provide ***complete solutions*** versus stand-alone products." *Id.*[27]

63. Throughout this time period, however, one of the most significant problems that MSC faced was obtaining the development resources to meet customer demand. As Mr. Curry testified, "we would have many, many, many enhancements that we wanted to do and we couldn't do them all, so we always had to prioritize them and there would always be some that we didn't get to and some customer who wanted those." T. Curry Dep. Tr. at 191:20-192:1. This was because MSC was "having a problem hiring people," especially in the late-1990's. In part, this was because the Internet-Boom was well underway. Engineers, and particularly software developers, were in high demand, and it was difficult to retain, let alone attract, capable developers to work on MSC's

---

26

[27] The terms "complete solutions" or "total solutions" have different meanings to different people.

Others have defined it as "the ability to offer an integrated suite of tools that would perhaps include drafting, design and analysis and manufacturing modules that [are] integrated through a common interface." R. Barclay Dep. Tr. at 80:18-21. At its most general level, the term "total solutions" refers to a vendor's (or a select group of vendors') ability to supply customers with all of their computer-aided simulation software tools that the customer needs to solve their specific engineering problems.

customization projects. Indeed, past efforts to hire developers from UAI had met with legal challenge.[28]

**c. The Frank Perna Era.**

64. By 1999, it was clear that Mr. Curry had the correct vision. But, he was a developer at heart, not a business manager.[29] So Mr. Perna, formerly a director of the MSC Board and CEO of EOS Corporation, took over responsibility as CEO. Mr. Perna found that MSC's product development organization was inefficient and plagued with a significant backlog in both releasing new features and providing specific customer support. F. Perna I.H. Tr. at 86:24-87:8. Mr. Perna also inherited command of MSC at a time when HKS/ABAQUS terminated MSC's ability to offer customers advanced non-linear capability, as part of ABAQUS's plan to initiate head-to-head competition with MSC.Nastran's linear capability. Mr. Perna quickly embarked on a plan to correct MSC's shortfalls.

65. Mr. Perna restructured the company, changed the management, clarified its strategy, and sped up implementation of its business plans. *See* RX 155. In doing so, Mr. Perna made clear that his "vision" was to further "position MSC in the larger ... market" and to "be the leading supplier of software and related services to markets where technical information is needed and used." *Id.*

66. In January 1999, Mr. Perna initiated plans to increase list prices by 4% – the first MSC list price increase in 10 years – to account for the effects of inflation on MSC's cost structure.[30] As Mr. Perna testified, this plan was conceived of in January 1999, and implemented in July 1999,

---

[28] T. Curry Dep. Tr. at 217:21-218:16 ("Everything was Internet, and I mean, there were just lots of alternatives for computer science-type people to go work on, and our business was pretty stodgy-looking I guess compared to some of the real high-tech – this is when the whole high-tech thing was really going wild, and it was hard to get people to do the kinds of things we wanted to do. Some of our code was still written in Fortran. It was a language they didn't even teach. . .. In fact, I think years and years and years before there had even been some kind of a problem with hiring people.").

[29] Mr. Curry even recognized in his deposition that he "was not able to grow the top line of the business [*i.e.*, revenues, as opposed to earnings or profits]. ... [And] the price of the stock followed pretty much the top line of the business in that era of dot-coms and all the things that were going on." T. Curry Dep. Tr. at 259:3-9.

[30] *See* RX 2349 (***pre-acquisition*** e-mail announcing that prices are being increased "worldwide and for all products" by four percent to "account for inflation and . . . increased capabilities.").

prior to the acquisition of CSA. As Mr. Perna explained, he raised prices because MSC's "operating expenses ... [were averaging] increases of over 4 percent for the last two or three years and our payroll had gone up on an average of 4 percent per year."[31] F. Perna I.H. Tr. at 114:3-12. At the time, Mr. Perna did not know whether the list price change would "stick" and have any impact on revenues, since most contracts were negotiated. *Id.* at 116:9-11. And in fact, as Mr. Perna testified, there is still no indication that this minor list price change had any effect on annual revenue. *Id.* at 118:2-10.

67. In July 1999, MSC acquired MARC to solve its non-linear problems and acquired needed developers. As the proposal to acquire MARC observed, "ANSYS is our primary competitor in the general-purpose market. A ***large part*** of its attractiveness is its ability to analyze moderately non-linear structures... We believe that we can successfully compete in this market with MARC, especially with a tight coupling to our other products, and at the same time ***retard*** HKS from encroaching on our general-purpose space.... Non-linear applications are usually the most complex-intensive simulation problems, but best represent real-world phenomenon. With better computer price performance and multi-processor computers, more engineers are moving from linear approximations to non-linear simulations." RX 758.

68. In June of 1999, MSC acquired UAI and then CSA in November, most importantly, to obtain teams of talented developers. In these negotiations, Mr. Perna negotiated directly with Drs. Morgan (for UAI) and Swami (for CSA). The details of the negotiations are discussed *supra* ¶¶ 127-129; ¶¶ 102-106.

69. In 2001, MSC acquired AES to obtain better systems capability. It was through this acquisition that MSC begin distributing ELFINI as one of many resellers and that Dassault, as a partial owner of AES, came to hold a small interest in MSC.

70. In late 2001, MSC entered into a strategic alliance with Dassault to allow MSC to become further integrated with CAD systems and to provide MSC access to the "Catia V5 Platform," a well-architectured software development platform.[32] Under the 2002 Agreement, MSC agreed to

---

31

[32] As Ken Blakely testified, the Dassault strategic alliance is good for users "because the people who use CATIA, GPS, will get additional functionality on top of what they already have.... It's also good

develop software products using the Catia V5 software tools. The Agreement was designed to allow MSC to sell and market Dassault technology, along with many others, as part of a bundled package.

71. In 2002, MSC acquired MDI because customers have been demanding improved computer simulation, including analysis involving rigid bodies.

72. Despite these efforts, MSC's revenues, after accounting for its acquisitions, have not grown. It's share prices have dropped dramatically from almost $20 at the beginning of the year to $8.60 as of this filing. MSC had negative operating income of $2.4 million in the first quarter of 2002.

**2. CSA Was an Inferior Point-Solution Vendor Whose Time Was Past.**

73.

74. Dr. Swami, a former developer at MSC and founder of CSA, established CSA in 1982 "primarily to do consulting." Swami I.H. Tr. at 12:25-13:8; Swami Dep. Tr. at 12:6; RX 3023. His goal was to hire two or three additional software developers, as a vehicle to continue his business of engineering consulting. *Id.* At that time, CSA was primarily interested in writing complementary software, and was not writing any Nastran code. *Id.* at 13:25-14:6. This complementary software involved "developing outside programs to interface with Nastran or ... [with] some of the data that comes out of Nastran." *Id.*

75. Beginning in 1984 or 1985, CSA began doing work for customers that were using COSMIC/Nastran, which is the public-domain version of Nastran. *Id.* at 14:14-15:18. CSA

---

for users because we will have a consistent user interface for our graphical products, consistent being based on V5." K. Blakely Dep. Tr. at 104:16-25.

provided consulting, training and some enhancements and development for customers who were users of COSMIC/Nastran. *Id.*

76. Around Swami 1985, CSA began selling its previously-developed enhancements commercially. *Id.* at 15:19-16:8. At this time, CSA's customers still had to lease COSMIC/Nastran directly from NASA through the University of Georgia. *Id.* It wasn't until 1988 that CSA actually bought a copy of COSMIC/Nastran and began selling COSMIC and CSA's enhancements as a single software product, called CSA/Nastran.[33] *Id.*

77. Thereafter, CSA sought to compete by offering a limited-feature, lower-priced product. CSA's business model generally centered around playing "catch-up" to MSC, a strategy it followed with only limited success, even during its heyday – a period from 1991 to 1995, which coincides with Ford's investment in CSA. RX 187.[34]

78. But even in its "heyday" of 1995, CSA was a small company with a limited number of employees. At its height it had a mere 30-32 employees in Los Angeles. Swami I.H. Tr. at 129:19-21. As the business collapsed, CSA's staff hemorrhaged: when it was acquired by MSC, CSA had approximately 15 employees. *Id.* at 135:6-8. It did not even have the resources to maintain a sales staff, despite the fact that Dr. Swami believed that sales persons were necessary to compete with other solvers for large customers. *Id.* at 164:14-25; RX 3068.

---

[33] At this time, there were a number of different Nastran versions that were being sold in the market, most of which have since died out, including RPK/Nastran and BUTLER/Nastran. Swami I.H. Tr. at 15:18; 17:11-21; 19:5-15. Significantly, Dr. Swami testified that he was the fifth or sixth company (chronologically) to introduce a Nastran-based solver. *Id.*

[34] Despite people's ***general impression*** that CSA was lower-priced, it was not always the case. In fact, Dr. Swami testified that CSA had lost some customers "due to price." Swami I.H. at 166:15-22. In addition, once customers paid for added functionality CSA was not necessarily any cheaper. A case in point involves CSA's decision to add non-linear capabilities. In 1995, Ford noted its expectation that CSA develop non-linear analysis in version 95. RX 166. By version 96, CSA still had not developed the requested non-linear capability. In March 1996, CSA was getting ready to introduce CSA/GENSA, its non-linear software. Customers, however, balked when CSA had the audacity to try and charge for this capability, which was already included in MSC.Nastran. As an internal CSA memo from CSA's sales representative explained, "I've told some who are interested in GENSA that it will be some percentage of their existing license fee and they've balked at that – they thought it would be free because MSC/N has nonlinear analysis built into MSC/N. By the time we've added 25 to 50% fee increase, we've passed MSC on price." RX 185.

79. CSA also had serious problems funding research and development. *See, e.g.*, RX 152, RX 1329. The changes in the FEA industry started to "pose stringent demands on [CSA's] resources" as early as 1995. RX 941. In fact, CSA relied on external investment, like the funding it received from Ford, just to keep up with competitors like MSC.

80. Even with CSA's lower prices, Dr. Swami testified that CSA could not convince customers to purchase its product. Swami I.H. Tr. at 101:15-102:7. Even for those customers that were purchasing some CSA, it was most often just to have a copy for mere evaluation. CSA was never the only "general purpose solver" at any significant account.[35]

81. As Dr. Swami explained, CSA was at a significant disadvantage because it "didn't have [a] pre and post [processor];" it "didn't have [particular] product feature[s]" and it "didn't have [the same] interface." Swami I.H. Tr. at 166:15-22. Customers were also dissatisfied with CSA's performance. CSA had touted features that never worked properly.[37]

---

35

[36] Indeed, customers had trouble justifying the idea of having to pay for two very similar codes, especially when CSA's was less complete.

37

Bingham and his engineers are VERY frustrated with CSA/NASTRAN optimization. They had high hopes . . . that V96 would accomplish what OPTIM2 could not do for them. It so far does not. Tony's engineers have asked him to purchase MSC/NASTRAN so they can do their optimization. . . .[They] have also been in communication with [CSA] the past few weeks sending in data decks that don't work in CSA/NASTRAN....").

This "mistake," coupled with an earlier misrepresentation to Ford, damaged CSA's credibility and put the company "in the same position we have [been in] for the past 10 years – playing 'catch up' to MSC." RX 187.

82. Another reason for CSA's failure to grow was the fact that customers were also "interest[ed] in other general-purpose codes," of which there were "lots."[38] Swami I.H. Tr. at 25:15-26:24. For example, "in addition to the various flavors of Nastran, there [was] ANSYS, ABAQUS, COSMOS, NISA, ALGOR ..., SDRC, ... PTC, [and] ELFINI." *Id.* Dr. Swami explained that, in his view, all of these codes "have features of analysis for all mechanical industries, [including] aircraft, automobile, [and] general industry." Swami I.H. Tr. at 38:8-39:8. And Dr. Swami made clear that "competition spanned amongst all finite element codes," not just among Nastran-based solvers. Swami I.H. Tr. at 37: 2-17.[39]

83. Because of the prevalence of alternative codes, and its inferiority when compared to MSC, CSA found that they did not have much success at most major accounts. Neither GM nor

---

[38] Significantly, Dr. Swami testified that there was nothing that was particularly unique about Nastran-based solvers, although each solver – ***including MSC vs. CSA vs. UAI/Nastran*** – has variations. Swami I.H. Tr. at 71:10-25. For example, with regard to the automobile industry, an area on which CSA most focused, Dr. Swami explained that the types of analysis typically needed – statics, vibration, buckling, dynamics, and nonlinear, "are available in almost all MCAE general-purpose codes." *Id.* Significantly, all of these codes claimed that they could "solve very big-size problems, so that would not be a unique advantage for Nastran." *Id.* at 35:15-18. Similarly, in discussing element libraries, Dr. Swami explained that "there is nothing known as a Nastran element.... [F]inite element textbook has shown how to derive finite elements. They are based on differential calculus and differential equation. So based on that, there are textbooks on finite elements and there are a number of elements. And even in the development of elements itself there are conforming elements, nonconforming elements and various categorization, and each developer of a finite element code may choose what they consider is the best element, yet we can all differ. Even a UAI, CSA and MSC in the element design we have chosen come different paths.... Each Nastran has designed their own element. So none of them were the same." Swami I.H. Tr. at 67:8-68:8.

[39] For example, in a 1996 internal CSA memo, CSA notes that "Volvo.GM Heavy Truck has decided not to even evaluate CSA/Nastran because ANSYS has such a nice tight interface with CADDs 5. I told him CSA/N works with CADDS 5 as well but he already made up his mind to stick with ANSYS. Evidently, ANSYS has an office nearby and was able to provide beautiful demos showing tight integration and ease of use." RX 184.

Boeing was interested in CSA.[40] As CSA admitted in one facsimile, "getting our foot in the door" at companies like GM and Chrysler was an "obvious problem since we have been unable to penetrate for [the last] 5 years or more." RX 190. Even at NASA, CSA did not enjoy much success.[41]

84. Ford was the one customer that seriously attempted to make a go of CSA, and was the indisputable mainstay of CSA.[42] When Ford started licensing CSA/Nastran around the end of 1991, MSC was already in full use. Swami I.H. Tr. at 201:6-5.

85. In the early 1990's, Ford's initial plan was to work with CSA so that it would be able to provide a low-cost solver to target its specific needs. Because of this, Ford provided CSA with funding. However, because CSA was so far behind MSC, both generally and with regard to Ford's specific needs, Ford only made investments in CSA to sponsor development of the capabilities it uniquely desired. *Id.* at 202:14-20.

86. Despite Ford's interest in CSA, all was not well at CSA. Things were so bad even in 1995 that CSA lamented that its "sales are so low, [they] can only go up." RX 180.

87. By 1995, fundamental changes in the industry were becoming all too apparent. As Dr. Swami explained, even as early as 1995, "[d]ue to the changing marketplace ..., the technology was rising much faster than our ability to compete." Swami I.H. Tr. at 166:15-167:20. Two trends

---

[40] Swami I.H. Tr. at 199:12-14, 217:1-4 (noting that CSA had approached Boeing/Seattle to get their business a "number of times without success." and that CSA had made pitches to General Motors from 1994 onwards without "much success.").

[41] Significantly, CSA never had any contract with NASA to develop enhancements to COSMIC/Nastran. Swami I.H. Tr. at 19:16-19. As Dr. Swami testified, "I haven't worked much with the NASA projects. Most of [CSA's] users were private customers. *Id.* at 26:11-14. Swami also testified that he was not aware of any NASA contractor customer that was using Nastran because of some contractual specification or requirement. *Id.* at 26:20-27:1.

[42] *See, e.g.,* RX 1328; RX 3036; RX 166.

in particular became apparent to Dr. Swami. First, Dr. Swami recognized that the market was moving towards greater emphasis on integration. Second, Dr. Swami realized that the advent of PC's as a significant analyst platform threatened Dr. Swami's business model. These industry changes challenged and ultimately defeated CSA.

88. ***First***, with regard to integration, Dr. Swami had recognized that, since 1995, the industry has been leading towards increased "simulation." Swami I.H. Tr. at 78:3-80:21. Although "at one time," the solver was "very dominant," that is "not the case now." *Id.* On "either side" of the solver sits "the pre and post" and "on the outside [is] the CAD;" so the market is "now changing so fast" and the "emphasis [on the] solver [has] becoming less and less," while customers are "becoming more and more" interested in software that provides "a total solution." *Id.* As Dr. Swami puts it, "Simulating reality: That's what it is all about." *Id.*

89. The increased importance of pre/post processors had significant impact on CSA, since CSA was not well-integrated into many existing pre/post processors, such as PATRAN.[43] For example, a 1995 internal CSA memorandum reports the fact that CSA lost business, in part, because of "several instances of poor support" and "[b]ugs in the way PATRAN interfaced" with CSA. RX 174. CSA also failed to establish a successful working relationship with SDRC.[44] In Dr. Swami's view, CSA's failure to team up with a pre/post processor vendor cast doubt on CSA's

---

[43] Dr. Swami testified that, while CSA/Nastran used "to work with PATRAN as a preprocessor," "later on we knew that there [were] difficulties in the later versions in interfacing." Swami I.H. Tr. at 57:3-13.

[44] In 1996, CSA had entered into an agreement to develop an interface for SDRC, but CSA failed to deliver. An internal CSA memo dated May 6, 1996 explains the issue: "What do you mean we don't have an HP version of the SDRC interface: The 1st quarter newsletter... says it is AVAILABLE for SGI and HP workstations! What am I supposed to do now, tell the customer that it was all an innocent mistake and we will have an HP version in a few weeks? This whole thing is way out of hand and I don't appreciate being put in the position of defending these 'mistakes'. First, I [had] to tell Ken Salisbury at Ford two months ago that we don't really have a decent interface (after we already told him we would) and now even our newsletters and advertisements can't be trusted. The message people are getting is that we want to be affiliated with SDRC but we don't want to do what it takes to really do it like MARC and Blue Ridge Numerics have. This is all very frustrating for me and I think it severely hurts our credibility. As I mentioned before, I can't even describe how positive a move this could have been for us at Ford. Now MSC is creating their SDRC interface and we will find ourselves in the same position we have for the past 10 years, playing 'catch up' to MSC." RX 187.

commercial viability, since it was obvious that "staying [in business] without a pre and post process[or] would be a difficult task." Swami I.H. Tr. at 167:21-168:6.[45]

90. The ***second*** market dynamic that had a profound impact on CSA starting in 1995 was customers' increasing desire to move analysis to PC-based systems.[46] As Dr. Swami explained, "[i]n mid-1995 onwards, the arrival of the personal computers required us to broaden our strategy." *Id.* at 81:19-20. Because more and more customers were switching to PC's and demanding integrated solvers, CSA felt compelled to move with the market to avoid having to ***"close[] shop in '95 [or] '96."*** *Id.* at 161:9-12.

91. This PC migration took tremendous resources. As Dr. Swami explained, it took "easily about one year or so, maybe two or three man-years in one calendar year," to adapt CSA/Nastran to PC's. In addition, CSA then had to "constantly update" its code, as new PC's "came out with different operating systems." Even in the workstation segment, CSA had to "devote substantial effort [to] optimize them [and] discretize" the basic code into each of different type of hardware. *Id.* As hardware proliferate[d], CSA's "commercial viability" post-1995 was "becoming more and more difficult." Swami I.H. Tr. at 115:12-17.

92. The advent of PC's also dramatically changed industry pricing dynamics, and destroyed CSA's pricing structure. *See Id.* at 121:14-122:16. Prior to the wide-spread use of PC's as an analyst platform, most FEA vendors would offer all their features as a bundled package, regardless of what the customer used. When customers started using PC's, many FEA vendors introduced different packages containing various subsets of the overall code. Thus, while prior to 1995, the "industry survived on its ability to give this full code with all these A-to-Z features," with

---

[45] *See also*, RX 2961 (Noting that, SDRC's FEMAP pre and postprocessor supports MSC whereas it does not support CSA."). Although Dr. Swami "wanted to team up with ***any*** pre and post," such as Altair's Hypermesh,"the business terms at which they were willing to team up with has got to make sense also, and we didn't get it from Altair or from any others." *Id.*

[46] "I would like to concur with Bill the importance of creating a PC based CSA/Nastran. The market is demanding lower priced, higher performing products and we, as developers of technology, must respond." RX 3028.

the advent of PC's, vendors were being forced to modularize, eliminating their ability to recover the cost of developing the newer, more advanced features from the "50 percent of the users" that were not interested in them.[47]

93. And customers, of course, were demanding greater and greater levels of functionality, service, support, and customization or integration into their engineering processes. Not only was commercial viability in the late 1990's becoming steadily more difficult, "the technical viability also was coming into question [by 1999] because, in addition [to] Nastran, [customers] wanted more in-depth nonlinear analysis, they wanted fatigue analysis, [and more generally they wanted] additional complementary products." Swami I.H. Tr. at 114:12-117:25. The end result of all these factors was that "a solver-only ... company like CSA was becoming ... commercially becoming ***less and less viable.***" *Id.*

94. By 1996, CSA's relationship with Ford was already rocky. In December of that year, Ford "informed [CSA] that they decided to cancel CSA/Nastran and were going to stay with MSC/Nastran as a single Nastran vendor." *Id.* at 206:1-4.

95. After Ford's decision to keep CSA on in 1996, Ford's actual usage of CSA/Nastran dropped significantly. *Id.* at 208:2-209:19.[48] It also had to drop its price and reduce the level of support it provided to Ford.[49] In fact, CSA's Detroit sales office was decimated, especially after

---

[47] As Dr. Swami explained, "the pricing dynamic that's difficult is ... selling Nastran with all its features for [one] price ... Suppose that tier one customer primarily uses only the statics, vibration, buckling features of this code only and turns around and comes back and says 'you have given me the whole Nastran for $15,000. I'm only using the statics, vibration and buckling only, give it to me for $3,000.' ***We will go out of business.*** So we cannot afford to price it for $3,000. . .. [U]p to Unix, nobody in the industry split that into modules. Towards the end, some people started doing that.... The bad years, post-'95. So up to 1995, we did not have that much pressure to modularize. But with the advent of PC's, the pressure was greater to do it, not [just] on the PC, [but] on the Unix also." Swami I.H. Tr. at 118:22-119:25.

[48] Even though Ford kept some CSA around, it embarked on an ambitious transition plan. Not surprisingly, as a result of the years of Ford-specific investments that CSA had made, Ford experienced some transition problems in moving from CSA to MSC in 1997, especially with regard "some of the functionality and user convenience that [CSA] had provided." Swami I.H. Tr. at 210:17-24. As part of its transition plan, however, Ford asked MSC to implement any missing features. *Id.*

[49] This was unusual, as Dr. Swami's strategy was not to compete against MSC by lowering prices below the standard price list. Swami I.H. Tr. at 93:11-96:6 (Q: Did you ever offer customers a

Dave Hendrie left in early 1997. *Id.* at 216:7-25. Dr. Swami testified that CSA lost almost half of its employees, having gone from a maximum of over 30 employees to about 16 or 17 by February or March, 1999. *Id.* at 129:14-132:10.

96.

97. As a result, when Ford told CSA in late 1998 that it was reconsidering its relationship with CSA, Dr. Swami became very "apprehensive." Swami I.H. Tr. at 225:22-226:25. In May 1998, knowing that Ford was going to "terminate" its CSA/Nastran license, CSA asked Ford to give it some warning ahead of time "because CSAR will have to take measures including a reduction in force and other budgetary requirements." RX 3080. CSA knew full well that losing Ford would have a severe domino effect on CSA's other customers and potential customers, and its ability to engage in further development. As Dr. Swami told Ford, if Ford did not sign a new agreement "CSAR efforts to sign up other prospective customers will be jeopardized, because such prospective customers will wonder why Ford canceled CSA if CSA/Nastran is a good product meeting Ford's CAE needs." RX 1272.

98.

---

reduced price that were switching from another Nastran product to CSA rather than if it was simply a customer who was renewing a license? A: No. We have a standard price list. They all pay the standard price list. . .. Marketing and salespeople have from a standard price to make discounts for various categories. . . I don't think we had such a policy. Because we had set our prices based on our costs and that – if that provides substantial savings, then customers would consider coming to us, otherwise, they may not come to us."); *see also* Swami I.H. Tr. at 158:8-11. ("Q: in the 1990s, do you recall any situations where you were receiving price pressure from MSC.Nastran. A: We had never worried about the price pressure from anybody. We had our own pricing."). In fact, Dr. Swami testified that he had been told that, "on the workstations," CSA's prices were, at times, higher than . . . [its] competitors' prices." Swami I.H. Tr. at 98:14-16.

99. When Ford finally told CSA that it was terminating its contract with CSA, Dr. Swami knew the long ride had come to an end. As he explained, "ever since '96, we were always worried when will this thing come to an end. We thought we are a material solution for them ..., and by early '99, January or February time frame, we knew that the thinking is that MSC is ... likely to be selected as a single vendor, and this time, this is it. There will be no further opportunity.... [The] '99 March letter was fairly – it didn't say that we will not reconsider, but I think we felt that that is the end of it, and this is the second time.... The first time we thought, 'Hey, did you consider all these things.' We had a reason to go back in '97 January, but in '99 March, that was – that was Ford's final decision." Swami I.H. Tr. at 214:17-215:9.

100. Swami knew that this time he would not be able to dig himself out of the hole that Ford created when it scaled back its relationship with CSA in 1997. CSA simply had no way of increasing sales, not only because it was functionally inferior to MSC, but also because it lacked a sales force.[50] CSA's only prospect of increasing sales – Lockheed Martin – turned out to be a dud. CSA "tried very heavily" at Lockheed Martin, but did not have "much success."[51] Swami I.H. Tr. at 184:15-185:20. Thus, although CSA "saw potential," the "end result was totally disappointing." The fact is Lockheed Martin's EPI center just "wanted to egg [CSA] on to get whatever their agenda was, but no one was really serious about doing much with CSA. That's the bottom line." *Id.* at 187:15-188:4; *see infra* ¶¶ 529-43; 553-59 (discussing Lockheed in more detail).

101. Realizing the end was near, Swami quickly initiated discussions with MSC by calling Dick MacNeal in October 1998 and telling him that CSA was willing to consider an acquisition. Swami I.H. Tr. at 225:6-15.

102. When Mr. Perna took over as CEO, he also took over responsibility for negotiating with CSA. This was in January 1999. Mr. Perna recognized that additional services and customization was required in order to remain competitive and grow the business in this evolving

---

[50] Swami I.H. Tr. at 164:17-25 (noting that CSA did not have a sales team because of "commercial viability," and that was "struggling to maintain [its existing] staff and put out the product. . .. It's a catch 22. You need more sales first to bring in more revenue, to have . . . more sales force.").

[51] Specifically, CSA signed a three-year agreement, giving them a standard 30 percent discount plus an additional 20 percent for the first year if a certain minimum was reached. But even after lowering the minimum and extending the time, Lockheed was not able to provide that minimum level of orders. Swami I.H. Tr. at 184:15-185:20.

market place. Therefore, MSC needed to hire experienced developers that could provide assistance. Thus, even though Mr. Perna knew that CSA was facing a difficult time, he realized that CSA's developer assets had value.

103. Negotiations with CSA proceeded with the classic initial high price and eventual "split the baby" result. Negotiations proceeded through April without much success, as Dr. Swami demanded $21.875 million. In April, MSC had reached an agreement to acquire UAI, and CSA formally lost the Ford account. Thus, MSC made a take-it or leave-it offer for CSA of $7.5 million in late May 1999. RX 3072. During this time, Mr. Perna did not do any analysis to evaluate the value of CSA's assets to MSC.

104. Dr. Swami went to India to deal with personal matters. Dr. Swami had already concluded – in his own mind – that CSA was no longer capable of surviving on its own as a seller of FEA solvers. He tried to shop CSA, but no one was interested. Dr. Swami noted, for example, that he had discussions with SDRC and Altair, but SDRC did not have "much interest," and "Altair was not looking for acquisition or anything." *Id.* at 170:19-172:19, 173:18-174:7. UGS had also expressed some interest in a potential transaction in early 1999, but ultimately UGS was not interested in acquiring CSA. Swami Dep. Tr. at 202:7-23.[52]

105. In August, Dr. Swami restarted negotiations. Mr. Perna believed that CSA had not found any other buyers. Ultimately, the parties agreed on a purchase price of approximately $10 million, a "split the difference" between Swami's last $13 million demand and Perna's last $7 million offer.

106. After a tentative deal had been reached with Swami, Mr. Perna instructed Mr. Mattson to prepare a proposal for the board that justified the $10 million purchase price. Although Mr. Perna reviewed the final proposal to the board, he did not review it in significant detail and did not make any significant changes to Mr. Mattson's work product. Moreover, the proposal did not reflect any discussion between Mr. Perna and Mr. Mattson about the reasons for the deal. Mr.

52

Mattson's marching orders were simply to justify the purchase price using three "what-if" scenarios. The board ultimately approved the acquisition of CSA.[53]

### 3. UAI Was an Engineering Services Firm That Sold UAI/Nastran As An Ancillary Product and Tried Not to Compete Against MSC.

107. UAI was a firm looking for a way to exit the market gracefully. It had an aging management and staff base with low morale. It was losing key accounts. It had lost confidence in its business model, consistently failing to meet expectations. Its sales were consistently declining creating a solid, negative trend for the company. It was seriously underfinanced. According to the

108. UAI began life as an engineering and computer science consulting firm in 1972. Its consulting focus was structural engineering and management science, consulting work which continued throughout its history.[54] J. Morgan I.H. Tr. at 40:4-7. In 1973, after MSC decided to commercialize MSC.Nastran and decided that it would no longer "participate in government-funded support or development of COSMIC/Nastran," UAI took over that responsibility. *Id.* at 25:17-22. This responsibility included correcting errors, creating technical documentation, and developing a few new features at NASA's request. *Id.* at 22:5-10.

109. In 1980, NASA decided not to renew its contract with UAI for maintenance and support of COSMIC/Nastran. J. Morgan I.H. Tr. at 29:2-8. Faced with having lost its primary contract, UAI decided to go-it-alone, and development efforts began to commercialize a proprietary

---

[53] Complaint Counsel has focused on CX 2278, which consists of a draft spread sheet prepared by Mr. Mattson that hypothesizes a future price increase. The term "price increase" does not appear in the presentation that went to the Board, nor was this draft ever shown to Mr. Perna. Mr. Perna did not micro-manage Mr. Mattson's preparation of these materials and so did not know how Mr. Mattson had generated the figures or with whom he had discussed the matter.

[54] For example, one of UAI's major endeavors was to simulate operations at the U.S. Postal Service's distribution centers. *Id.* at 40:9-11. Significantly, throughout UAI's history, UAI derived a significant portion of its revenues from activities ***other than*** through the sale of UAI/Nastran and related consulting or development. J. Morgan I.H. Tr. at 42:7-21 (noting that Nastran-related revenues hovered around 50 percent, with such revenues only accounting for approximately 65 to 70 percent at the time of UAI's acquisition by MSC because of UAI's deteriorating overall sales).

version of Nastran, called UAI/Nastran. *Id.* at 28:13-25. UAI purchased the then-current version of Cosmic/Nastran for a one-time lump-sum payment of approximately $21,000. *Id.* at 30:13-31:4.

110. After purchasing the right to resell Cosmic/Nastran, UAI "principally earned [its] money by performing specialized Nastran installations." J. Morgan I.H. Tr. at 55:2-56:25. For example, in 1983, Control Data Corporation (CDC) purchased 22 percent of UAI as a way of funding development of Nastran software for their new computer system, known as Cyber 205. *Id.* at 44:18-20.[55] Another specialized installation involved installing Nastran on an NEC computer for Goddard Space Flight Center. *Id.* at 55:2-56:25. UAI was also involved in "specialized niche Nastran development," such as specialized nonlinear capability for Caterpillar. *Id.* Unlike CSA, UAI did not try to compete with other solvers on price, and Mr. Morgan testified that he believed that UAI's prices were higher on a per-user basis. J. Morgan I.H. Tr. at 86:15-24.

111. Significantly, UAI's business model was designed specifically to ***avoid*** competition with MSC in the sale of software. UAI focused primarily on providing engineering services, and picking up the development scraps that MSC had not yet incorporated.[56] As Mr. Morgan explained, "MSC's Business model could not support addressing every need of every customer. So our business model was to ***focus on the gaps***." J. Morgan I.H. Tr. at 57:8-10.

112. For this reason, throughout its history, UAI targeted large customers with unusual or arcane needs.[57] *Id.* at 61:12. "[T]he customer focus was large manufacturing corporations" with

---

[55] Ultimately, this system was installed at Chrylser and few other sites. J. Morgan I.H. Tr. at 45:12-14. As Mr. Morgan testified, "Chrysler became a customer" because "Chrysler bought its computer equipment from Control Data" and UAI "had the only Nastran software running on the computers they purchased." *Id.* at 57:16-22.

[56] J. Morgan Dep. Tr. at 116:15-19 ("CSA attempted to duplicate the most frequently used features of MSC/Nastran . . . UAI did not attempt to do that. We had a different business model."); *see also* T. Curry Dep. Tr. at 189:4-19 ("I'd be hard-pressed to tell you specifically which features and functions, but just my impression was that they only had bits and pieces of what we had and they had to go in on a very specific basis and with a feature.... [T]ypically where they would exist, it would be in coexistence with Nastran because people would have the full gamut and then there would be some feature that we didn't get around to doing yet that UAI would do and they would go in and sell a couple of copies of UAI, but there was always a big ***gap***.").

[57] For example, UAI's contract with McDonnell Douglas and Northrop-Grumman on the F18 aircraft involved a limited usage program. J. Morgan I.H. Tr. at 58:20-59:11. Significantly, MSC/Nastran had been used on that project, and continued to be used after contracting with UAI.

"large budgets" and "large groups of engineers" using large amounts of software, since these customers were more likely to need "***niche solutions***." *Id.* at 61:12-25.

113. UAI's specialized development efforts were often customer-specific and did not have broad appeal to general users of finite element software. For example, UAI "created ASTROS, but customers didn't want it. The U.S. Air Force wanted ASTROS, but the commercial customer base did not." *Id.* at 137:4-17. These development contracts were also relatively small and limited. As a result, UAI's Nastran revenues never exceed more than a few percent of MSC's.

114. ***UAI never believed*** that its specialized development contracts or its ability to sell UAI/Nastran to big customers resulted ***in any trickle-down, or network, effects***. *Id.* at 126:22-127:7. ("Q: In regard to trickle-down effects, if you got into Chrysler with more Nastran and into General Motors with Nastran, is there a trickle-down effect in regard to suppliers under General Motors and Chrysler turning to UAI. A: I would have to say no. We attempted to locate such an effect. We did business with Chrylser for more than 20 years. We were able, in 20 years, to identify one customer at less than 20,000 dollars a year in revenue, due to the ***trickle-down effect***. So it's – ***there's no such thing.")***.

115. UAI recognized that it was competing in a vast market. As Mr. Morgan testified, "the reality of the matter is ... you can perform almost any simulation with Nastran or ANSYS, or a product from Dassault Systems called ELFINI. Literally, there's no reason why you can't do the calculation with either of those three." *Id.* at 64:19-25.

116. Mr. Morgan recognized that there were differences among various solvers, including significant differences between UAI and MSC. Among the major ones were: MSC's superelements versus UAI's substructuring method, MSC's superior nonlinear capabilities, MSC's richer DMAP language, and MSC's superior aeroelastic capabilities. *Id.* at 116:8-117:8. Mr. Morgan also testified that UAI has a "speed of processing problem" and that they "were at a disadvantage compared to CSA/Nastran and MSC.Nastran from hard benchmark data." *Id.* at 140:16-18.

---

*Id.* Because Northrop was using UAI for such a specialized purpose, MSC never considered this to be real competition. As MSC's account representative for Northrop Grumman explained, "[i]f somebody is actively promoting their products in my account, usually I will find out about it. The fact that I didn't indicates to me that perhaps they weren't strongly marketing this particular program for additional seat[s] of UAI." R. Barclay Dep. Tr. at 159:9 -162.

117. UAI found that it was extremely difficult, and generally not worth the effort, to get customers to switch from MSC to UAI. As Mr. Morgan explained, "[t]he finite element user community and its management is extremely conservative. Glaciers mover faster. So feature and function equivalence and pricing 50 cents on the dollar does not generate business.... Literally, you can't price – you cannot be successful pricing the software as the sole mechanism of competition with Nastran or ANSYS, or any other finite element software. That was our conclusion from a business point of view." *Id.* at at 134:16-135:5.

118. Because UAI was focused more on providing engineering services and obtaining Nastran-related development contracts, UAI did not seek to copy MSC's product or make UAI/Nastran particularly compatible with MSC.Nastran. As Mr. Morgan testified, UAI would "not sacrifice ease of use or clarity of input and output for the sake of a direct compatible [to] MSC['s] input or output formats." *Id.* at 118:8-11.

119. As the marketplace began changing and shifted toward demand for integrated solvers and PC platforms, UAI realized that it had to make changes if it wanted to keep up with industry trends and keep its head above water. RX 3040. But UAI hit a wall.

120. UAI lacked the resources to become a significant play in the changing FEA marketplace. At the time of the acquisition, UAI had less than in annual software revenue in the U.S. in 1999 and its net income in the previous year was only It had few employees; at the time of its acquisition, it employed only 19 people. J. Morgan I.H. Tr. at 57:20-21; *see also* RX 2339. This lack of resources inhibited its ability to release new software and prevented it from moving into new areas.

121. For example, UAI failed to release its Open Architecture version on time. J. Morgan I.H. Tr. at 74:6-11. Like CSA, the need to integrate with other CAE tools, such as pre/post processors, was taking its toll on UAI's development resources. *See, e.g.,* RX 959 ("Third party software known as pre- and post-processors continue to become more important to our customers for successful use of UAI/Nastran. These programs require modifications to our software so that we provide data exchange in our competitor's data formats. Significant effort must be made in this area.").

122. By 1998, UAI's business model was faltering. Because of the difficulties in growing sales, Mr. Morgan periodically requested from his staff a review of revenue potential "***to see if we were going to stay in business***." J. Morgan I.H. Tr. at 91:23-24. By 1998, UAI's revenues had significantly fallen off. *Id.* at 93:24-94:2. According to Mr. Morgan, "[b]y '98, [UAI] had completed a major funded effort, that is, a software development effort funded by the U.S. Air Force."[58] *Id.* at 94:10-15. When that contract terminated and was not renewed, UAI found itself with substantially lower annual revenues.

123. To compensate for these lower revenues UAI stopped paying dividends to its shareholders (who were all employees) under the Employee Stock Ownership Plan ("ESOP"), through which Mr. Morgan and the other employees had purchased UAI from its founder in 1992. *Id.* at 47:18-20; 98:4-100:20. But even with this "last gasp" measure, UAI still did not have the resources to fund new development, such as the incorporation of ASTROS functionality into UAI/Nastran. As Mr. Morgan testified, in order to obtain a "benefit [from] the features and functions of ASTROS, UAI would have to invest its own money to transfer that technology into Nastran ..., and that was expensive ... [UAI] had no ability to fund that." *Id.* at 137:7-17.

124. UAI admitted to its shareholders that it was not growing as management had projected.[59] UAI was not able to attract new customers and was losing its largest and longstanding customers, accounting for the majority of its revenue.[60] These customers did not want to have to pay for niche "point solution" products; they wanted everything rolled into one integrated set of tools.[61]

---

[58] The contract for the Air Force involved developing ASTROS, which is a "structural optimization software package specifically targeted for fighter aircraft, wing optimization." J. Morgan I.H. Tr. at 96:11-97:4. Significantly, the ASTRO program was based off the original Cosmic/Nastran code, not UAI's proprietary code. *Id.*

[59] "To Our Shareholders.... Compared with previous years, the company found no new customers in two areas planned for growth: the sale of ASTROS licenses and the capture of new software development projects." RX 959.

[60] UAI had lost a major contract with Lockheed Tactical Aircraft systems in Ft. Worth. *See* RX 959. Mr. Morgan feared the five licenses at McDonnell Douglas might be disappearing, and efforts to negotiate with Northrop Grumman went nowhere. J. Morgan I.H. Tr. at 211:6-15. Chrysler had indicated to UAI that it was under significant pressure to eliminate "as many software vendors as possible." Morgan Dep. Tr. at 58:10-18.

[61] We are under significant attack at some accounts, where the competition is offering essentially "free" Nastran if the customer will license the PATRAN pre/post processor software. RX 953.

125. UAI was also experiencing problems with its aging staff and had an unacceptable turnover rate. *See* RX 989. Management found that the "current company culture [was] not respectful of individuals," "some employees do not respect and/or value senior management," and there were "questionable standards of professionalism among some employees." *Id.* All in all, UAI had serious problems with "***low employee morale***." *Id.* Things had become so desperate at UAI that an employee ***donated*** a "great deal of his time" to convert a customer's DMAPs, just to help win some business. J. Morgan I.H. Tr. at 238:22-239:16.

126. Thus, Mr. Morgan contemplated an exit strategy. As Mr. Morgan explained, his "analysis of the company" indicated the need for a "viable exit strategy." *Id.* at 180:6-16. This was because UAI was "a 20-person company, [t]he management team was, for the most part over 50 years old, [and] we had not developed a middle management team to grow into senior management." Thus, UAI faced the prospect that, "at the time of retirement of senior management," there would be no one "who's going to run the company to generate revenue" necessary to buy out the current employee-owners under the ESOP. *Id.* at 180:2-181:1.

127. In March of 1999, UAI and MSC began the discussions that lead to UAI's acquisition. MSC's CEO Frank Perna contacted Mr. Morgan because of his understanding that Mr. Morgan was an excellent developer with a good team of developers and at that time negotiations with CSA were bogged down based on what Mr. Perna believed were Dr. Swami's excessive price demands.

128. As part of the initial discussions with MSC, Mr. Morgan and Mr. Perna discussed Mr. Perna's view "of coupling customer demand with performance of the development team," which was a "theme that [Mr. Perna] knew UAI operated by and needed to be improved at MSC." *Id.* at 185:11-186:15. As Mr. Morgan has testified, Mr. Perna described his desire "of injecting into MSC some of the high performance characteristics of the small team of UAI" developers. *Id.*

129. The UAI negotiation progressed rapidly; Mr. Perna and Mr. Morgan were able to quickly agree on the $6.5 million purchase price. And again, Mr. Perna had Mr. Mattson develop a board proposal after having reached a tentative deal.

130.

## III. COMPETITORS PROVIDE POWERFUL ALTERNATIVE CAE SYSTEMS AND FEA SOLVER TECHNOLOGY.

131. The competition MSC feared did not come from two codes with de minimis sales at a few of its customers. As detailed below, MSC faced and continues to face substantial competition from its ***real competitors***: ANSYS, ABAQUS, Permas, Elfini, NE Nastran, SDRC, Elfini, LS Dyna, LMS, PTC, CDH, and now AI*Nastran. These firms have expanded their capabilities, formed new alliances, developed new products and are even stronger forces in the market than they were in 1999. This competition is fierce and the competitive pressure from these firms spurs MSC to innovate and to keep its prices low.

132. While Complaint Counsel's Findings of Fact cite ANSYS as a competitor to MSC.Nastran, Complaint Counsel fails to recognize the overpowering evidence that ANSYS was in 1999, and remains, MSC's ***enemy number 1.*** Over the last several years, MSC and ANSYS drove each other to improve and enhance their products. ANSYS' new weapon in its "war" with MSC is AI*Nastran. ANSYS promises that AI*Nastran will surpass MSC.Nastran technologically. ANSYS also has the total solution approach to meeting customer demand. Finally, it has a research budget that dwarfs CSA's and UAI's. In short, AI*Nastran has all the ***key*** competitive elements that UAI and CSA lacked.

133. ANSYS, of course, is not MSC's only source of competitive pressure. ABAQUS, with an enviable reputation for quality, has repositioned itself and added strong linear solutions, including the capability of doing large structural analyses. ABAQUS now has a Nastran "Displacement Strategy" and its use is growing at all of MSC's major accounts. ABAQUS has earned its status as MSC's ***"biggest threat."*** T.Curry Dep. Tr. at 168:8-10. Moreover, Permas, which MSC regards as one of its ***key*** competitors, has already penetrated the automotive industry with its superior solutions, and MSC is fighting Permas to regain its "number 1 [status] in acoustics." RX 2650. As MSC acknowledges, it faces "significant price pressures [from] Permas, CDH, LSTC [LS-Dyna], ANSYS." RX 2839.

134. In addition, customers themselves pose perhaps the greatest price disciplining effect on MSC. Their ability to reduce usage or partially switch their analysis to other solvers, internal codes, and PC products provide all that is necessary to keep MSC's prices in-line.

135. Customers do not even have to switch all of their usage. Partial switching is a viable option. The choice is the customer's. "They could do both. They could switch completely or they could just switch certain analysis to other codes." O. Ibrahim Dep. Tr. at 150:12-14. A customer's decision to use even ***slightly*** less MSC.Nastran could significantly impair MSC's revenues.

136. In fact, customers need not switch ***to something else*** at all – they could simply choose to do nothing. As Dave Dimas explained, MSC can "lose business to people deciding to do nothing, which is probably [MSC's] biggest competitor." D. Dimas Dep. Tr. at 244:24-245:1. In the face of an actual – or threatened – MSC price increase, customers can simply elect to reduce the number of seats they use or simply forgo, doing certain to wash out any expected gain from a price increase, especially one in the five to ten-percent range.

137. But switching is not even necessary to constrain MSC's prices. MSC's – as well as other FEA vendors – growth rates are dependent upon expanding usage by their customers, something that can only be done by keeping prices competitive and building strong customer relationships.

### A. Seeks to Compete With MSC to Be the Dominant Provider of Computer Simulation Software.

#### 1. and MSC Each Views the Other As Its Number One Competitor.

138. Complaint Counsel argues that ANSYS does not compete against MSC.Nastran. That position is untenable. That position ignores the overwhelming evidence from ANSYS and elsewhere that ANSYS views MSC as its most significant competitor.

139.

140.

141.

142. Just as ANSYS calls MSC its closest competition, so does MSC call ANSYS its "enemy number 1." RX 2103. *See also* RX 3021 ("our most notorious competitor"); RX 784 ("we are [forming the ANSYS Competitive Analysis Team] to better understand our #1 competitor and to develop/communicate strategies and tactics to beat them"); RX 2384 ("ANSYS - principal competitor" for MSC). Indeed, MSC's business plans are centered around efforts to "thwart

---

62

MSC's Pretrial Brief explains why that is fatal to Complaint Counsel's case. *See* MSC's Pretrial Br. at § 2.

ANSYS." *See, e.g.,* RX 2218. MSC's Software Development planning team also recognizes that "***competition is fierce and relentless***" and, since it is impossible to focus development efforts on all competitors simultaneously, it chose to focus on "***ANSYS as enemy number 1.***" RX 2103.[63]

143. ANSYS has been considered MSC's primary competitor throughout the company's history. As early as the late 1980's, MSC co-founder Dr. Richard MacNeal proclaimed ANSYS as MSC's "strongest competitor." RX 117 ("Three important finite element programs were introduced in the United States in the same year as NASTRAN. They were ANSYS..., MARC ..., and the SAP program.... Over the years, the ANSYS program has become ***our strongest competitor***.").

144. In September of 1997, MSC's Sales Manager, Richard Murphy, observed that ANSYS was selling its competing "Multiphysics" and "Structural" products at prices that were significantly below the prices for MSC.Nastran and MSC.Patran. The MSC sales force insisted that this was "evidence of the fact that we need a bundled product" priced in the ANSYS range to effectively compete against "our ***most notorious competitor, ANSYS"*** RX 3021; *see also* RX 3022.

145. In 1996, MSC introduced a new packaged product called MSC.FEA. MSC.FEA was a bundled product of MSC.Nastran and MSC.Patran, and sold for approximately 70 to 80 percent off of the list price for the two products individually. *See* RX 3033; *see also*

146.

---

[63] In 1997, MSC formed a team to respond directly to competitive pressure from ANSYS: the ANSYS Competitive Analysis Team. "This team has been created to fulfill our need of having a complete competitive analysis of our ***number one competitor – ANSYS***, Inc." RX 784. The Team's objective was to understand the markets and industries where ANSYS has competitive advantages; to learn the technical strengths and weaknesses of ANSYS products; and to follow ANSYS marketing and distribution strategies. All in all, the "ultimate goal of the ACAT team is ... to beat ANSYS in the field...." *Id.* In an internal document outlining MSC's ANSYS Initiative, MSC explained that its vision was to encourage "every existing and prospective ANSYS customer [to] recognize and select MSC as its preferred supplier of CAE solutions" and that its objection was to achieve "a measurable growth of profitable new business revenues by targeting existing ANSYS accounts and winning new opportunities in the [so-called] ANSYS marketplace." RX 162.

***Significantly, no such team was ever formed to address UAI or CSA.***

147.

148.

149.

150. Indeed, all of the products or modules sold by ANSYS form part of a "total solution," which ANSYS recognizes is critical to becoming a successful high-end supplier of FEA and MCAE

64

software. ANSYS' own website demonstrates that ANSYS competes against MSC on the basis of its ***product "suite,"*** not just its ANSYS linear FEA Solver. *See* RX 3064 (noting that ANSYS has "the ultimate in design simulation and virtual prototyping software," and that ANSYS/Multiphysics "integrates the best structural, thermal, CFD, acoustic, and low-/high-frequency electromagnetic simulation capabilities in one software bundle. It's like getting the entire ANSYS simulation suite in one convenient package.");

151. By having a full array of MCAE tools, ANSYS is able to effectively compete against MSC for both large and small customers, in virtually every industry desiring FEA solving technology. Unlike UAI and CSA, whose presence was rapidly disappearing, ANSYS' price and other competitive pressure on MSC has steadily intensified throughout the late 1990s and is all the stronger now. *See* RX 471. Because simulating reality is a tall order, doing it cheaply is impossible.

152. Unlike CSA and UAI, ANSYS has significant resources to devote to improving its functionality and its code – and it has and will continue to do so. *See* RX 385 (noting that ANSYS invests over 20% of revenue in research and development). The following chart estimates the total dollar amounts of research and development spending by ANSYS as compared to MSC, UAI, and CSA:

---

[65] As Todd Brown, MSC's sales representative for Ford explained in his deposition on January 29, 2002, "ANSYS has in the last two years started to promote themselves as a conceptual design and a multiphysics software provider, but what it really comes down to is they're saying they do more than just a finite element solver. They're trying to position themselves as that they can do things similar to what we can do with our campus [*i.e.*, MSC's multi-product offering accessible through tokens that can be used for any MSC product], that they can provide the solving, the design, the conceptual design, and hooks to a lot of different things and a lot of different pieces of software. So I don't just see them as a competitor in the solver; I see them as a competitor across the board in many, many MSC products. And they're doing service work also, which means enhancements not just to their core software but to different people's process in trying to capture that process." T. Brown Dep. Tr. at 257:21-258:11.

| Year | ANSYS | MSC | UAI | CSA |
|---|---|---|---|---|
| **1995** | | $ 22.5 million | $ 1.5 million | $ 0.41 million |
| **1996** | | $ 23.4 million | $ 1.5 million | $ 0.85 million |
| **1997** | | $ 21.4 million | $ 1.5 million | $ 0.92 million |
| **1998** | | $ 25.3 million | $ 1.5 million | $ 0.8 million |
| **1999** | | $ 27.6 million | ~1.5 million (e) | ~ $ 0.7 million (e) |
| **2000** | | $ 30.3 million | N.A. | N.A. |
| **2001** | | $ 35.8 million | N.A. | N.A. |

Sources: RX 3049; RX 458; RX 3050; RX 3051; RX 3052; RX 301; RX 2339; RX 2906; RX 2907; RX 3060; RX 3059.

153.

154.

---

66

[67] Complaint Counsel's theory that there are large, complex problems for which NASTRAN is needed is belied by the customer testimonials on ANSYS' website. RX 276 ("Computing power limited the use of analysis in the past..., but now that hurdle has been overcome with the purchase

•

(ellipses in original)

•

•

•

155. These competitive realities – that MSC.Nastran is ***not*** a "monopolist" free of competition from anyone or anything – were further underscored by testimony and other statements

---

of a variety of high-powered workstations and the computational efficiency of ANSYS' new PowerSolver.").

68

A recent analyst report further illustrates ANSYS' aerospace capabilities, noting that the company was selected by NASA to model the X33 Prototype (NASA's next generation delivery vehicle) as well as the Space Shuttle. RX 352.[69]

156. ANSYS is also capable of providing software solutions for automotive customers.

157. ANSYS also provides software solution for other projects or industries, such as buses,[70] trains,[71] cruise ships,[72] and rockets.[73]

---

69

Notably, CSA lacked any real aeroelasticity capability. RX 2993.

70

71

72

158. Simply ignoring all this ANSYS evidence that it is competitive with MSC.Nastran in virtually all respects, regardless of industry or usage, Complaint Counsel seeks to marginalize ANSYS' competitive significance, citing their technical "expert" Dr. Venkayya.

Indeed, the whole point of the ANSYS training manual is to assist customers that are ***switching*** from MSC.Nastran to That training manual is dated September 1996. RX 473. Dr. Venkayya's distortion of this "ancient" training manual ignores the numerous enhancements and improvements ANSYS has made to its code in the past six (6) years.

159.

160. ANSYS is capable of solving very complex large problems. The release of Version 5.7 in November 2000, significantly increased ANSYS' capability for solving extremely large complex problems.

Indeed, ANSYS has

---

73

worked hard over the years, and has been successful, in enhancing the speed of its solver technology and automating the computer-aided engineering process.

161.

In fact, customers rely on ANSYS' "substructuring" and "superelement" capabilities for dealing with complex analysis.[75]

162.

---

[74]

Indeed, ANSYS' degrees of freedom (DOF) capability is limited only by practical machine capacity, and not by software limitations.

[75] *See*

[76] Because ANSYS serves customers with large complex problems, mixing element types is common and relatively easy.

163.

And – now – ANSYS publically proclaims that it is the "global leader in optimization software." RX 261.

164.

But, ANSYS is customizable using both ANSYS' Parametric Design Language, (APDL) and FORTRAN. *See* ANSYS' APDL Programmer's Guide ("the applications for APDL are limited only by your imagination.").

In addition, ANSYS works directly with its customers to provide them with needed functionality.

165.

---

[77] Complaint Counsel argues that UAI and CSA were closer substitutes than ANSYS because ANSYS does not have DMAP. But Complaint Counsel's own expert disavowed reliance on customizable DMAP as a basis for his opinion.

This is not surprising. As discussed below, UAI's and CSA's DMAPs were vastly different from MSC's DMAPs, *see supra* ¶¶ 352-55, and other FEA codes, such as ANSYS, have the ability to meet customized needs.

166. Because of the great overlap between MSC and ANSYS, even in its litigation posturing statements to the ALJ here, ANSYS has acknowledged that it competes for "new customers."

167.

78

168. Complaint Counsel – and – ANSYS (for purposes of this case) argue about switching costs for existing customers. None of ANSYS' documents nor its employees' testimony support any finding that the switching costs from MSC to ANSYS are greater than the switching costs from MSC to UAI or CSA.

169. ANSYS has had significant successes at ***partially switching out*** MSC's major accounts. At P&W, ANSYS is effectively replacing MSC.Nastran.

As part of this process, ANSYS and P&W publically announced that Pratt & Whitney was standardizing on ANSYS for structural and thermal analysis, replacing "other FEA codes." *See* RX 314 ("*Pratt & Whitney Selects ANSYS as their Standard FEA Tool*").

[79] Needless to say, MSC was not happy. "While we've heard of the wide spread use of ANSYS in P&W south ...., we now feel the pain up north as well. Apparently, the P&W in-house thermal

170. MSC.Nastran was displaced at Fiat Avio and Alfa Romeo in 1995. "ANSYS Inc. announced today that Fiat Avio and Alfa Romeo Avio selected ANSYS software as their preferred design analysis solution, displacing NASTRAN software from MSC." RX 3013.

171. ANSYS usage has also increased significantly at Raytheon.

Early in 1999, Raytheon became angry about MSC's pricing options and ***told MSC to "kiss off."*** RX 2064.

172. ANSYS has been successful in ***partially switching*** Bell Helicopter, which now uses both MSC.Nastran and ANSYS. In a February 2001 Bell Helicopter Trip Report, MSC Sales Representatives, John Pardy and Jim Swan, noted that Bell Helicopter "made a point of letting us know that when the ANSYS contract expired at the end of 2000 it was converted to paid-up. He specifically pointed out that 'ANSYS isn't going away' and that '***MSC isn't the only boat in the pond*** – it may be the biggest boat, but not the only one." RX 3038.

173. MSC revenues at Delphi have been reduced over time because of partial switching to ANSYS – and ABAQUS. Bruce Hart explains that "[o]ur revenues have reduced over the years... . because they've reduced the use of our products ... a lot of it was [attributed] to ABAQUS. But a majority of it was ANSYS." B. Hart Dep. Tr. at 108:16-25.

174. ***ANSYS, in short, is looming and threatening presence.***

---

analysis code CHAP2 is to be replaced by ANSYS.... The ramification ... is that ANSYS will be used as the structural/thermal analysis code for the entire group ... Yes, that means ***MSC/NASTRAN is being replaced by ANSYS*** in this group ... and many others. [P&W] indicated that the current plan is to migrate to ANSYS by the end of this year!" RX 146.

175. ANSYS has competed – and has been evaluated[80] – against MSC at numerous other accounts, including:

[81]

176. Dr. Venkayya's (and Complaint Counsel's) broad assertions of ANSYS' non-competitiveness with MSC.Nastran are unsupported and just plain false.

---

[80] Complaint Counsel places great emphasis on customers that "consider" using UAI or CSA, as opposed to customers that actually did switch any significant usage to them. *See* Compl. Counsel Pre-Trial Br. at 13. There is, however, a critical distinction between customers that consider switching to – or even obtain an evaluation copy of – UAI or CSA and those that embark on a serious plan to phase-out or displace MSC.Nastran. A customers' ***idle*** threat to consider CSA does not, in and of itself, reduce MSC usage, and so does not constrain MSC's prices. Numerous customers had evaluated UAI or CSA had rejected them as inadequate,

*see infra.* ¶¶ 356-64 (discussing UAI's and CSA's consistent failure to pass the evaluation stage).

A ***credible*** threat to switch to an alternative code has more bite. As Vanderplatts demonstrated throughout these Findings and as will be show at trial, ANSYS, HKS, ELFINI, Permas, CDH and others have all proven that they can convert preliminary evaluations into strong positions at many accounts, displacing significant MSC.Nastran usage. Significantly, this is exactly the type of evidence – real world examples of partial switching – that defeated Compliant Counsel's market definition *in R.R. Donnelley*. *See In re R.R. Donnelley*, 120 F.T.C. 136, 172 (1992) (rejecting Complaint Counsel's market definition where "[s]everal buyers have switched their high volume printing ... in recent years, including – as the ALJ found – present buyers who testified in the preliminary injunction hearing that ... they would not switch in response to a significant price increase.") *See* MSC's Pretrial Brief *passin.*

[81]

### 2. and Are Biased Having "Partnered" With Complaint Counsel, to Raise Their Rival MSC's Costs.

177. ANSYS has been working with Complaint Counsel to "hurt" its "number one competitor," MSC.

178. This desire has manifested itself into real marketplace conduct.

179.

180.

82

181. Another opportunity arising from Complaint Counsel's investigation and suit involves the fact that the litigation has itself diverted precious resources from ANSYS''s primary competitor. The benefit to ANSYS's, of course, increases as time passes and, as the costs of the litigation take their toll.

182.

183. ANSYS, not surprisingly concluded,

184.

[83] Significantly, Complaint Counsel also wanted to make MSC stew. On September 17, 2001, at least "five members of the Commission Staff ... directly contacted SAS ...., inquired into the details of Schaeffer's negotions with MSC's broker and suggested to Schaeffer which assets Schaeffer should seek to acquire from MSC." *See* RX 3017 (September 21, 2001 Letter from T. Smith to J. Simons); *see also*

**B.** .

185. In November 2001, Dr. Schaeffer, through SAS, announced an alliance with MSC's number one competitor, ANSYS, to develop and market AI*Nastran as part of ANSYS' total solution offerings.[84]

186.

187.

[84] In addition to Dr. Schaeffer, SAS was founded by Dr. Richard MacNeal, MSC's former Chairman, CEO, and founder. Dr. MacNeal, however, is not on Complaint Counsel's witness list. This is not surprising, since as early the late 1980's, Dr. MacNeal proclaimed ANSYS as MSC's strongest competitor. RX 117. ("The important finite element programs were introduced in the United States in the same year as Nastran. They were ANSYS ..., MARC ..., and the SAP program.... Over the years, the ANSYS program has become our strongest competitor."). In addition, Dr. MacNeal was involved in evaluating CSA after Dr. Swami approached MSC in 1998, and his "due diligence" report shows that the considerations given to a potential transaction related to CSA's developers and its technical capabilities, not on any impact on MSC's prices or revenues. RX 221. In addition, Dr. MacNeal was involved in evaluating CSA after Dr. Swami approached MSC in 1998 and his "due diligence" report shows that the considerations given to a potential transaction related to CSA's developers and its technical capabilities, not on any impact on MSC's prices or revenues. RX 221.

188. Drs. Schaeffer and MacNeal provide ANSYS' AI*Nastran with the needed Nastran-based code technical capability. ANSYS provides AI*Nastran with "sustainability" and credibility, a key factor for customers.

189. All this stands in stark contrast to the flailing status of CSA and UAI in 1999.

190.

85

191.

192.

RX 324.

193. The primary reason that ANSYS expects competition to be tough is MSC's excellence. There is no demand for an "MSC clone," such as CSA.

194. ANSYS also had witnessed the flailings of CSA and UAI.

195.

"Q:

### C. Competes By Offering One Of The Most Advanced, Technologically-Superior Finite Element Analysis Solvers – .

196. While Complaint Counsel dismisses HKS as a competitor, any realistic analysis of HKS' ABAQUS product confirms what MSC has long known – ABAQUS is – after ANSYS – MSC.Nastran's most significant competitor. Complaint Counsel seeks to ignore HKS' ABAQUS because ABAQUS is considered to be the pre-eminent non-linear FEA solver by many industry observers – including MSC. But Complaint Counsel cannot obscure (i) the overlap between non-linear and linear solutions; (ii) ABAQUS' rapidly growing strength and enhanced functionality in the linear arena; (iii) ABAQUS' reputation and entrenchment at the very aerospace and automotive customers Complaint Counsel expresses concern for; (iv) actual customer switching from MSC.Nastran to HKS' ABAQUS product.

#### 1. The Industry Considers Solver and MSC.Nastran As Competitors.

197. MSC personnel have long viewed HKS' ABAQUS as an MSC.Nastran main competitor. As early as 1997 – two years before the acquisitions of CSA and UAI – now 5 years ago and even before HKS' drive to best MSC.Nastran's linear capabilities. MSC viewed "HKS as a direct competitor for linear analysis." RX 2236. As MSC's former President and CEO Tom Curry explained, "I saw ABAQUS as ***our biggest threat*** in the solver area ***altogether*** long before the acquisitions of CSA and UAI. T. Curry Dep. Tr. at 168:8-10. By the time of MSC's acquisitions of CSA and UAI in 1999, it was already understood that "nonlinear and ***complex linear analyses*** are ABAQUS' strengths." *See* RX 791.[86]

---

86

198. According to MSC's 1997 Aerospace Industry Strategic Plan, "ABAQUS is an extremely capable program" which "has linear capabilities" in addition to its nonlinear functionality. RX 771. MSC in 1997 feared that, if it wasn't for then-existing customer misimpressions about HKS' linear abilities, ABAQUS or ANSYS would "have the best chance of becoming the 'master model' for analysis." *Id.* At that time, MSC predicted that "the strategy of HKS is to reset the battleground to being that of only nonlinear analysis, claiming that the real work is nonlinear and that linearity is only an approximation and one that is not always easily made." *Id.*

199. MSC sales personnel recognize the competitiveness of ABAQUS – and how HKS' ABAQUS a far more threatening pressure than UAI or CSA ever were, let alone by 1999. MSC aerospace salesman Ron Dyer testified "I would lower my price for ANSYS and ABAQUS in an effort to keep them out of an account, a bigger account ... because they have the ability to compete with me in those arenas where UAI and CSA did not." R. Dyer Dep. Tr. at 127:17-23; *see also id.* at 141:13-19 ("The client can go to ABAQUS, which, by the way, provides linear analysis.")

200. HKS' experiences in the marketplace are consistent with MSC's view that HKS' ABAQUS competes with MSC.Nastran.

201.

202. When in 1999, ABAQUS and Dassault's ELFINI solvers – and not MSC.Nastran – were competing for Boeing's FEA solver needs,

203. Moreover, Complaint Counsel's exclusion of FEA solvers with non-linear capabilities from the relevant product market is nonsensical. A nonlinear FEA solver could solve for a linear function as well.

---

87

88 Dr. Paul Sorensen – who is the "Sorensen" in Hibbitt, Karlsson & Sorensen – has been with HKS for 23 years and was most recently HKS' Vice President of Sales and Marketing.

204. To better compete with ABAQUS, MSC.Nastran provides nonlinear functionality as well as linear functionality. Notably, as Dr. Swami acknowledges, CSA/Nastran had no real non-linear capabilities; nor did UAI. Both companies knew they needed non-linearity to remain viable. *See, e.g.* Swami Dep. Tr. at 65:21-66:126, 90:20-91:6.

205.

Indeed, Complaint Counsel (and Dr. Hilke) said ABAQUS was ***not*** a "general purpose solver" Compl. Counsel's FOF ¶ 375, but

*See*

206.

207.

208. With regard to complex linear analysis,

209.

*Id.*

210.

211. That strategy is becoming more and more successful today as HKS not only improves its linear capabilities, but also convinces customers that its previously-linear analyses done with MSC.Nastran should be performed with ABAQUS in order to achieve a more accurate result.

212.

213. Complaint Counsel and its expert Dr. Venkayya clearly have an outdated view of HKS' ABAQUS product.

214.

215.

216.

**2. ABAQUS Solver Is Already Used By Virtually All MSC Customers.**

217. HKS' ABAQUS product is deeply entrenched in virtually all major aerospace and automotive accounts, including Ford, GM, Honda, Caterpillar, Lockheed Martin, Boeing, and BMW. RX 3004. Non-linear analysis, which is generally accepted to be more realistic (since in the real world everything is non-linear), is becoming increasingLY common as computer hardware has become increasingly more powerful and lower-priced.

218. ABAQUS (and ANSYS) had invested in developing its loyal user bases by targeting engineers while they are still in school. As MSC had observed, "many universities have ABAQUS ... and even more have ANSYS ... If someone uses a finite element package in school and knows that it works, when they go into industry, they will recommend that package to their employer. This gets a lot of free mileage for the competition." RX 2412.

**3.**

219.

220.

**4. Not Only Are Solver And MSC.Nastran Competing For The Same Customer Usage – Has Already Partially Displaced MSC.Nastran.**

221. As a result of the GM Benchmarking exercise in 2001, HKS has replaced MSC.Nastran at General Motors Powertrain business.

222. GM Powertrain made clear that it was comparing ABAQUS to MSC.Nastran with an eye toward ***replacing seats*** of MSC.Nastran with ABAQUS.

223.

224. MSC is well aware of ABAQUS' competition at BMW. According to MSC, "BMW plans to calculate the valve train dynamics and the corresponding structural excitation forces using ABAQUS." RX 2636.

225. Other customers, like Freightliner, compared MSC.Nastran and ABAQUS and decided to purchase ABAQUS. According to a Freightliner representative, "While I appreciate your offer for setting us up with Nastran, I think we will be going with HKS ABAQUS. There are several reasons. One, ABAQUS is also a standard product used in DaimlerChrysler and Freightliner. It is also supported by MEDINA, the pre/post-processor used at Freightliner. The pricing for a full license, not limited to development only, is much more affordable than what you are offering us. Also, ABAQUS provides the opportunity to do nonlinear dynamic analysis, which has interesting research potential." RX 2164.

226. Any difficulties alleged by Complaint Counsel from switching customers from MSC.Nastran to ABAQUS are reduced by the Nastran-to-ABAQUS translator provided with ABAQUS.

227. HKS' Nastran-to-ABAQUS translator has been of interest at Lockheed Martin.

228.

229. HKS expects the improved linear performance of version 6.3 of ABAQUS to further erode MSC's position with various customers, including John Deere, Caterpillar and Delphi.

230. HKS personnel view MSC.Nastran as ripe for competitive gains.

**D.** .

**1. Competes with MSC Through Its Stand-Alone Solver, , As Well As Solvers Within that Run On-top Of Its Leading CAD Design Platform.**

231. In January of 1998, MSC's "Background for FY99 Operating Plan" noted that "CAD vendors, especially Dassault, are just beginning to push into the professional analysis area with products like their ELFINI." RX 2236. While Dassault's ELFINI was always competitive for Designer analysis – due to Dassault's dominance in the CAD area – in the brief period of time between January 1998 and today, MSC.Nastran's competition with ELFINI for professional analysis has also become quite fierce.

232. MSC.Nastran competition with ELFINI has been especially fierce in MSC's large aerospace accounts. ELFINI is the ***preferred linear analysis tool at Boeing Commercial Aircraft Group***, while MSC.Nastran is present only as an alternate FEA code. R. Dyer Dep. Tr. at 217:22-25; RX 1791; E. Jones Dep. Tr. at 116:2-3, 117:19.

In July 2001, MSC noted that "[t]he Boeing Commercial Internal Loads group is currently deciding if they should use MSC.Nastran or ELFINI for the Sonic Cruiser." RX 2557.

233. **Cessna** has told MSC "that they [were] using quite a bit of [ELFINI] and that the use [of ELFINI was] on the rise." J. Baldwin Dep. Tr. at 164-166. Joe Baldwin of MSC "took quite seriously how much capability or how much of that overlap [between MSC.NASTRAN and ELFINI] was available for ELFINI growth. *Id.* Baldwin took ELFINI's Cessna presence into account when

he developed his Cessna proposal. *Id.* at 168-169. MSC noted that it had to secure the Cessna account from "price erosion to competitors," including "CATIA ELFINI." CX 1832.

234. MSC European representative Pascal Bois perceived Dassault and its ELFINI solver to be a "main threat" at the **Airbus** account: "DS [Dassault Systemes] will try to replace our software with Catia," which includes ELFINI. RX 2501.

235. MSC sales representative Keane Barthenheier explained that MSC gave a discount to **Aviation Partners** in order to prevent them from using "ELFINI Aero or Boeing [codes]. He made some good concessions to get [the account]." RX 2560.

236. **Bombardier** also uses ELFINI. J. Baldwin Dep. Tr. at 166:17.

237.

238.

239. ELFINI also competes against MSC.Nastran in MSC's automotive accounts.

240.

R. Dyer Dep. Tr. at 79:17-18 ("ELFINI is definitely a

competitor" to MSC.Nastran"). Complaint Counsel's own expert

Moreover, unlike UAI and CSA, ELFINI not only has unparalleled technical support and a robust distribution channel.

241.

### 2. Complaint Counsel's Attempts to Align and MSC Are a Red Herring. Continues to Remain One of MSC's Primary Competitors

242. In 2001, MSC acquired AES in order to expand its systems business. Dassault owned 19% of AES, and as part of the AES acquisition, Dassault obtained 7% of MSC's stock. Dassault's small interest in MSC is a passive investment. Dassault does not hold a seat on MSC's board, has no influence over the operations of MSC, and must vote with the majority. When MSC bought AES, MSC became one of 30, non-exclusive, distribution partners of IBM, Dassault's primary distributor. MSC can sell Dassault products to small and medium companies.

243. In April 2001, MSC and Dassault signed a memorandum of understanding forming the basis of a "strategic alliance." In April 2002, a definitive agreement was reached, although final arrangements are still being worked out.

244. The alliance between Dassault and MSC does not limit competition between Dassault and MSC. In fact, Toyota Motor Company just announced that it was switching to CATIA , including its solver modules. As a result Toyota will likely reduce its usage of MSC.Nastran. The strategic alliance ***excludes MSC.Nastran, Marc, and ELFINI***. RX 2252. *See* K. Versprille Expert Report ¶¶ 37-45; K. Versprille Dep. Tr. at 43:1-44:23.

245. MSC entered into the alliance with Dassault, because it saw Dassault's Catia V5 platform was the future and it provided MSC a convenient means for developing its next-generation graphical user interface and pre/post processing software. The relationship will make MSC/Patran fully compatible with Catia V5 by using the toolkit developed for the Catia V5 platform. By doing so, MSC Patran will be able to link into Dassault's Catia V5 platform as well as operate with other CAD systems or even on a stand-alone basis. In addition, MSC will create software that runs inside the V5 platform that will allow it to offer total CAE solutions.

246. The alliance provides MSC with an opportunity to expand sales by building on the Catia V5 platform and introducing new and innovative products to the market. *See, e.g,* K. Blakely Dep. Tr. at 64:14-19. By forming this alliance, MSC will be able to improve its own technology and integrate its technology with Dassault's in order to improve customers' ability to engage in complex computer simulation in a seamless fashion. As the industry recognizes, customers are demanding seamless integration across the design process.

247. MSC is not the only software company to have a partnership with Dassault. Dessaut's web pages has over 40 press releases about software companies forming partnerships, including LMS and ABAQUS.

248. Complaint Counsel's assertion that Dassault somehow has the incentive to stop competing with MSC is not sensical. As an initial matter, Dassault competes aggressively against other CAD/MCAE systems. If customers believe that the solver technology on the Dassault platform is too expensive, they can reduce reliance on that system or choose an alternative CAD system, such as those sold by PTC and UGS/SDRC. Thus, just as manufacturers have a powerful incentive to keep the cost of their inputs low, so too Dassault has the incentive to keep down the cost of solver technology component of its platform. Notably, Dassault has given its CAD customers the flexibility

to use a wide array of solvers, including ANSYS, ABAQUS, COSMOS, and GPS (which is Dassault's embedded solver).

249. Moreover, there is no evidence that Dassault intends to discontinue ELFINI. To the contrary, all indications are that ELFINI continues to exist as a product – and, therefore, as a competitor to MSC.Nastran. For example, in a joint presentation to Boeing in July 2001, Dassault and MSC announced, "***a single 'common FEM capability' that replaces ELFINI and/or MSC.Nastran is not planned***." RX 2665. "The expected ***multiple FEM software product offerings*** will be supported by the organizations that make the sale." *Id.*

250. In a press release sent to users of MSC.Nastran and ELFINI, MSC stated, "ELFINI will continue to be developed, since it is embedded in CATIA.... We [MSC] will sell and support ELFINI and MSC.Nastran and all of MSC.Software's and DS's CAE products." RX 1234.

251. Similarly a Dassault announcement stated, "MSC.Software [will] focus[] on V5 vertical applications complementary to Structural Analysis applications as well as on complementary disciplines (non linear, thermal, electromagnetic ...) while DS will continue to focus on the Structural Analysis infrastructure and generic Structural Analysis applications such as ... Elfini Structural Analysis ...." RX 3073; *see also* RX 3074 ("DS will focus on Structural Analysis applications [including] Elfini Structural Analysis"); RX 3075 (showing that DS will offer "scalable structural analysis" from "assembly" through "subsystem" to "full vehicle" while its V5 CAA Allies will offer other types of analysis).

252. As Dr. Versprille, the CAD/CAE industry consultant will explain, by entering into an agreement to build the next generation of Patran on the V5 platform – and ensuring that MSC.Nastran will integrate with CATIA – MSC is simply responding to customer demand.

**E.**

253.

But MSC's ***Automotive*** Application Business Unit realizes that major automotive accounts around the world are considering partially switching from MSC.Nastran to Permas – and in at least one major account (Chrysler) actually replacing – MSC.Nastran with Permas.

254.

He is ***dead wrong***. In preparing for MSC's August 2001 meeting with DaimlerChrysler Auburn Hills ("DCAH"), MSC's Doug Roach wrote, "Permas ... recently replaced Nastran in [the] Commercial Vehicles Department in [DaimlerChrysler] Stuttgart because of improved Schlechtweg Analysis."[89] MSC's competitors had also noticed this occurrence:

255.

256.

257.

[89] RX 2843. (Schlechtweg Analysis is a specific method of durability analysis).

[90] RX 362; *see also* RX 1938 ("STATIC ANALYSIS Car Body of a Cabriolet" with 130,225 Shell Elements; 134,864 Nodes; and 809,000 Degrees of Freedom).

258. MSC is actively attempting to counter Permas' competitive pressure – today. Having already lost its Nastran business with DaimlerChrysler's European truck division to Permas and facing significant competition from PERMAS in Japan and America, MSC's Automotive Application Business Unit regards Permas as one of its "***key*** competitors" as Permas threatens to gain "[a]cceptance ... as having superior automotive content and expertise."[91] The DaimlerChrysler merger is seen as an opening for Permas in America, expanding Permas' position as a "current competitor" and a "potential roadblock[]" to the MSC.Nastran Americas Three-Year Growth Plan. RX 2860.

259. MSC.Nastran's loss of the Daimler Chrysler Commercial Vehicle business in Europe to Permas provides a blueprint of what would happen if MSC were to raise prices or reduce innovation. On February 27, 2001, MSC European sales representative Thomas Grassinger portended the loss of DaimlerChrysler commercial vehicles if MSC.Nastran did not meet the customer's demand and keep up with Permas' advancements:

> DCAG Commercial Vehicles in Untertuerkheim is using a specific method to do durability analysis, called "Schlechtweg" (SW) ... SW is a standard / bread and butter method, which is used on a daily basis. Right now, DCAG is using a MSC.N User Modifiable (UM) program. [which has several disadvantages] .... Due to the above disadvantages, DCAG initially contacted us during late 1999, to set up a common project for the development of SW analysis as a standard MSC.N core feature....
>
> Unfortunately, we did not manage to provide any progress to the DCAG requirement until late 2000, so DCAG asked Intes, the vendor of ***Permas,*** to provide a solution. Intes was able to provide a SW analysis solution to DCAG (at no charge), within several weeks....

---

[91] *See* RX 2843 ("Permas – recently replaced Nastran in Commercial Vehicles Department in Stuttgart because of improved Schlectweg Analysis."); RX 915 (MSC "Nastran is under pressure at DaimlerChrysler, truck devision [sic] is doing PERMAS because of the high prices of Nastran."); RX 2835 ("Recently the Permas is started prevailed in AP. Toyota is seriously thinking it now."); RX 2876.

> If we fail to provide SW analysis in MSC.N, it would be more than predictable, that DCAG will ***increase the usage of Permas*** as their standard SW analysis tool – more Permas usage ***means less MSC.N usage*** – which means less license fees after the DCAG Germany MSC.N contract expires at the end of 2002... .
>
> The SW analysis requirement from DCAG is a serious threat and an excellent opportunity for our future DCAG business/relationship at the same time.... RX 2162.

260. As it turned out, MSC lost that opportunity, and, ultimately, ***all*** of its MSC.Nastran business at DaimlerChrysler Commercial Vehicles Department in Europe to Permas. On March 2, 2001, Mr. Grassinger reported "that DCAG commercial vehicles in Untertuerkheim has a project in place, ***to replace*** MSC.Nastran with Permas for their main application, ***Schlechtweg analysis.*** DCAG thinks that effective Ma[y] 1st, the remaining minor technical Permas issues are solved together with Intes (Permas vendor) and ***Permas will be used as their standard production tool,*** after that." *Id.* By August 2001, the replacement was complete: "Permas ... recently replaced Nastran in [the] Commercial Vehicles Department in [DaimlerChrysler] Stuttgart because of improved Schlechtweg Analysis." RX 2843.

261. In reaction to the Pernas competition at DaimlerChrysler, MSC automotive established an "Initiative in Product Development" to develop an MSC.Nastran "Schlechtweg" analysis to combat Permas. RX 2867.

262. MSC sees Permas' success in Europe having a spill-over affect in America. Most immediately, MSC expressed concern that "***Freightliner*** might follow asap, in case they follow the DCAG durability methods." RX 2162. MSC was also aware that DCAH was benchmarking Permas. Thus, Doug Roach, recognizing DCAH's and DCS's "considerable efforts over the past 12 months [to] find[] and/or creat[e] a possible replacement for MSC.Nastran," made sure to apprise MSC personnel of DCAH's interest in Permas in preparation for an MSC meeting with DCAH in August 2001. RX 2843.

263. But the Permas threat is not confined to DaimlerChrysler; rather, ***Permas is a threat to MSC's position in the entire automotive market.*** As a specific example of Permas's wide influence, an MSC Asia Pacific sales representative reported in April 2001 that "Recently the Permas started to prevailed in AP [Asia-Pacific]. ***Toyota*** is seriously thinking it now." RX 2835. Similarly,

in March 2001, an MSC European sales representative wrote to Jeff Morgan, "Permas is dominant at ***Porsche***. It could favour Permas to expand further." RX 2634. That same e-mail noted that Permas was starting to become a threat at ***Audi*** and ***Volkswagen***, was a strong threat at DaimlerChrysler, and was dominant at Porsche. RX 2635. Consistent with these concerns, in early 2001, another MSC European sales representative "found manuals of PERMAS at several companies while visiting them during the last few months." RX 2650. Audi, ***BMW***, DaimlerChrysler, Volkswagen, Opel, ***Ford*** (Germany), Porsche, ***Renault***, ***Volvo*** and several Tier One suppliers were all asking questions "mainly influenced by the capabilities of Permas." *Id.* More generally, MSC Europe in 2001 viewed "PERMAS (from Intes Company in Germany) and HKS [as] the ***most*** serious competitors in automotive." RX 2644.

264. On a fundamental level, it is Permas's functionalities that make it such a serious threat to MSC.Nastran's position in automotive. Like MSC.Nastran,

Permas offers many of the same types of analysis as MSC.Nastran: "Permas enables the engineer to perform comprehensive analyses and simulations in many fields of applications like stiffness analysis, stress analysis, determination of natural modes, dynamic simulations in the time and frequency domain, determination of temperature fields and electromagnetic fields, analysis of anisotropic material like fibre-reinforced composites." *Id.*

265.

266. Recently, Permas appears to have significantly increased its automotive-related analysis capabilities. During a March 9, 2001 MSC "NVH Strategy Conference Call," MSC expressed concern that "Permas has a better acoustics solution, faster in throughput, data recovery.... MSC is on its way to loss of credibility. MSC's core areas of Acoustics and NVH are under high

pressure." RX 3010. With respect to dynamics, MSC expressed concern because "Permas has a good data retrieval system. In sol[ution] 111/112 amount of data is huge 100 gigs. Permas does it with 5 gigs.... Permas will be able to focus on all sol[ution] 111 type customers." *Id.* Solution 111 is modal frequency response; therefore, "all sol[ution] 111 type customers" includes, at least, the entire automotive industry. *See, e.g.,* RX 1223 (showing that DCAH uses sol 111). And, the DaimlerChrysler Commercial Vehicle experience demonstrates, Permas has advanced considerably beyond MSC.Nastran in SW durability analysis.

267. In light of Permas' potential and realized success, it is not surprising that, in an internal presentation on May 2, 2001, MSC realized that it had a "Rapidly eroding competitive position" in the automotive industry, and that, in the area of "Solvers," it noted that although MSC.Nastran has the "dominant position," it is facing "***significant price pressures*** [as] Permas, CDH, LSTC [LS-Dyna], ANSYS [are] all positioning themselves to get the bulk of the Linear Statics work Nastran currently does." RX 2839. It is also not surprising that, in light of all the questions being raised about Permas's acoustics capabilities, a European sales representative requested that Jeff Morgan "[p]lease think about ... speed[ing] up the acoustics development within MSC to get back as number 1 in acoustics." RX 2650.[92]

268. In sum, Dr. Venkayya appears to have selectively formed his opinion about Permas being no threat to MSC.Nastran.

**F.** .

269. CDH is a partnership of three individuals – Mladen Chargin, Leo W. Dunne and David Herting – who are "internationally acknowledged experts in the development and application of MSC/Nastran." RX 3077. "They have made significant contributions on the international level in the development of methods and software for numerical simulation... FE-Analysis/Crash are at the core of [CDH's] activities. Whether it's a solution for a single component, an assembly or a complex system – [CDH] tackle[s] the most challenging problems." *Id.* Most recently, CDH has

---

92

Thus, the fact that DCAH felt that it could replace MSC.Nastran with Permas for certain types of analysis with only a cursory knowledge of Permas actually speaks highly of Permas's potential as a more complete replacement.

worked with University of Texas professor Beninghof to develop ***a product called "CDH/AMLS" which threatens to revolutionize NVH (noise, vibration and harshness) analysis,*** MSC.Nastran's traditional area of strength in the automotive industry. By doing so, CDH has expanded the competitive field exponentially, encouraged innovation, and created a tangible, current price constraint on MSC.Nastran.[93]

270.

271.

[93] *See, e.g.,* RX 2839 ("NVH and high end work acknowledged as Nastran's strength/value add[ed]. Large models also key."); RX 3010 (describing "MSC's core areas [as] Acoustics and NVH").

272.

273. ***The widespread use of AMLS poses a dramatic, immediate threat to MSC.Nastran revenues.***

274.

275. However, this is just the tip of the iceberg – CDH/AMLS poses an even greater threat to MSC.Nastran sales because it ***creates a potential for auto companies to completely replace MSC.Nastran in the NVH space.***

---

94

[95] MSC has recognized CDH/AMLS as a ***"current competitor"*** in America. *See* RX 2860 ("Finite element solvers such as ABAQUS, ANSYS, PERMAS, ADINA, ***CDH/AMLS***, ALGOR, and in-house codes developed by our customers are current competitors.") (emphasis added).

276.

277. MSC has reacted strongly to the AMLS competitive threat. Joe Maronick, MSC's on-site support person at DCAH, wrote in an e-mail to Omar Ibrahim and others at MSC, "I had feared, there is more ***widespread production use of AMLS*** at DC in the last 2 months. Use of MSC dmp ... has dropped steadily since mid-November. Currently, this is just AMLS serial on one large HP machine. As mentioned in Item #6 they are beginning to implement it across their other 3 'super' machines/clusters, and there are rumors of AMLS going parallel in the next couple months. ... Is it possible for Mladin or Beninghof to completely rid themselves of User-mod??" RX 1245.

278. Doug Roach believes that ***MSC must innovate*** its MSC.Nastran in response to the CDH threat. In preparing for a meeting with DCAH, MSC's Mr. Roach noted that he "expect[s] MSC to demonstrate equal or improved performance to CDH in ... sol 200, Component Modes Synthesis (with AMLS), and Acoustic Coupling." Accordingly, one of MSC's automotive

[96] CDH/VAO, or Vibro Acoustic Optimization, program "is a state-of-the-art interactive graphics computer program for coupled fluid-structure dynamic analysis. Emphasis has been placed on the fast analysis of large structures exceeding one million degrees of freedom." RX 852. CDH/VAO plays an integral part in DCAH's plans to reduce its MSC.Nastran usage.

"Initiatives in Product Development" is to enhance its MSC.Nastran (P)ACMS module to combat CDH/AMLS.[97]

279. Thus, CDH is providing direct ***competitive pressure*** on MSC.Nastran by reducing the use of MSC.Nastran in the NVH space and enabling the complete replacement of MSC.Nastran by another linear solver.

280. CDH appears to be exploiting its expertise with MSC.Nastran to help other competitors supplant MSC.Nastran in NVH and durability. As mentioned above, CDH appears to have helped to create ***"PERMAS*** enhancements, which will put tremendous pressure on our renewal in DCX-Stuttgart in 2 years." RX 2549.

**G.** .

281. Noran Engineering, Inc. was founded in 1991. Its product "NE.Nastran" was created following the conventions found in the Cosmic Nastran code and uses Nastran data files as its input and output deck. NE.Nastran has continued to evolve over the last eleven years and now can handle large, complex structural problems.

282.

283.

[97] *See* RX 2867. Other MSC.Nastran competitors have also responded to the competitive potential of the AMLS technology.

Vanderplaats Research and Design has already developed its own version of AMLS, which it calls the SMS Eigensolver. *See infra* ¶ 306.

284.

For potential replacement of some of their MSC.Nastran usage, NE.Nastran is also a competitor to MSC.Nastran. Many of Complaint Counsel's key witnesses have taken seats of NE.Nastran and ***evaluated*** it as a potential replacement for some of their MSC.Nastran usage (just as some did in the mid-90's from CSA and UAI).

285.

286. has also ***"evaluated"*** NE.Nastran as an alternative to MSC.Nastran. In March 2001,

287.

288.

---

[98] The individual at Freightliner who expressed interest in using NE.Nastran eventually chose ABAQUS over both MSC.Nastran and NE.Nastran. *See* RX 2164.

289.

## H. Seeks to Compete By Offering a Total Solution.

### 1. .

290. Over, the years, SDRC I-DEAS has provided steady competition to MSC.Nastran. "[T]he competition ... from SDRC occurs at the numerous customers where integration with their I-DEAS geometry is required." RX 2236.

This competition continues today. In April 2001, MSC Asia-Pacific's Kazuyuki Takahashi identified I-DEAS as MSC.Nastran's major competitor in NVH and structural analysis, and customers like Mack Truck and Orion Bus use I-DEAS as their primary FEA solver. RX 2236;

291. SDRC sees the same industry trends that MSC's industry expert Dr. Versprille sees. *See supra* ¶ 35.

292. Like Dr. Versprille and MSC, SDRC considered CSA and UAI to be insignificant.

293.

294.

295.

296. EDS acquired SDRC, and reacquired UGS, in September 2001. EDS launched SDRC and UGS as a combined entity – EDS PLM – on October 1, 2001.

**2.** .

297. UGS has long been affiliated with EDS. EDS is a multi-billion dollar multi-service firm providing computer related and other services to major industries. RX 832.

298.

299.

Although Complaint Counsel and its experts fixate on the fact that UGS ***considered*** CSA as a possible acquisition candidate,

300.

301.

Dr. Swami testified, "I knew

---

99

extremely well he is not at all the decision-maker." Swami Dep. Tr. at 193:3-4. Further, Dr. Swami had no significant contact with UGS after May of 1999. Swami Dep. Tr. at 201:16-19. Dr. Swami did not consider UGS to be a serious alternative to CSA's imminent financial distress.

302.

303.

304.

305.

**3.** .

306. Already a substantial competitor to MSC.Nastran, SDRC's Model Solution can only increase in competitiveness as part of EDS PLM Solutions. No longer required to focus on CAD and CAM products, which, as noted above, will be developed by UGS, SDRC is devoting its substantial resources on Model Solution. As Model Solution continues to enhance its offerings, more companies are likely to follow Mack's lead and adopt the FEA solver embedded within the integrated EDS/CAD/CAE system. By offering a "total solution" – and thus competing against MSC on multiple-levels, including MSC.Nastran – EDS provides substantial, across-the-board competitive pressure on MSC.Nastran.

307. Following the EDS/UGS/SDRC announcement, MSC's Ken Blakely urged that MSC should tout its interoperability with Dassault's CATIA to help MSC compete against EDS's "total solution": "EDS will say that SDRC users are now better off: they have a future with UG as a CAD system and with EDS as a services provider (more services than SDRC could offer). ... Our counter: EDS is right: SDRC users **do** have a future. But, they have a choice of their future–EDS, IBM/DS, or PTC.... If CAE is a consideration, then MSC.Software + IBM/DS is the best choice because of our products, our services, and our commitment." Thus, MSC clearly considers EDS's CAE solutions as competitors. Blakely Electronic Doc – Competitive Assessment of EDS/UGS/SDRC Announcement.

**I.** .

308.

309.

310.

311.

100

312.

**J.** .

313. though currently a very small company, poses a further threat to MSC.Nastran with its GENESIS solver. GENESIS is "a fully integrated structural analysis and design optimization software," capable of performing many of the same types of analysis performed by MSC.Nastran, including, among others, linear static analysis, dynamic normal modes analysis, buckling analysis, and frequency response.

314.

315.

316.

In fact, VR&D created GENESIS to take advantage of cutting-edge optimization technology which Nastran could not accommodate.

317. GENESIS also now has the ability to use CDH's AMLS method to perform eigenvalue analysis.

318.

319.

## K. Other FEA Solvers Compete With MSC.Nastran For Partially Switching Certain Customer Usage.

320. **ALTAIR OPTISTRUCT.** Altair offers a suite of products called Hyperworks. The Hypermesh component of the suite competes directly against MSC.Patran and is the dominant pre/post-processor in the auto industry, while OptiStruct competes against MSC.Nastran for optimization. In addition, OptiStruct has its own linear solver, which can be used to perform a significant portion of the analysis currently performed on MSC.Nastran.

CSA's Dr. Swami considered Altair to be a CSA competitor.

321. **PTC PROMECHANICA.** PTC, like Dassault, UGS and SDRC, offers an integrated CAD/CAM/CAE product, ProEngineer, with an embedded linear FEA solver called ProMechanica. Mechanica was a revolutionary technology in that it was the first to offer p-elements. As a result of competition from Mechanica, MSC added p-elements to MSC.Nastran. Numerous companies today use ProMechanica to perform work that could be performed on MSC.Nastran.

CSA's Dr. Swami considered PTC to be a CSA competitor.

322. **SAMCEF.** Samtech is a French company that offers an array of FEA products, including Samcef, "a general purpose FEA package for linear (static & dynamic & transient ) analysis." RX 1929. Samcef contains its own pre/post-processor. RX 1930. Samcef is a significant competitor in MSC's European accounts, such as Eurocopter. In November 2000, MSC had an initiative to help Eurocopter in "switching from Samcef to a global MSC solution (MSC.P[atran], MSC.N[astran], MSC.Marc)." RX 2550. In addition, in August 2000, Ken Blakely described Samtech as an obstacle at Aerospatiale Matra, which was paying Samtech to develop fatigue applications. RX 2501. CSA's Dr. Swami considered Samcef to be a CSA competitor.

323. **COSMOS.** SRAC's COSMOS/M is a scaleable FEA solution, which offers modules for static, frequency, buckling, thermal, nonlinear, dynamic and fatigue analyses. RX 718. COSMOS is used in the aerospace industry by such companies as Groen Brothers Aviation and in the automotive industry by such companies as Penske Cars LTD. *Id.* CSA's Dr. Swami considered Cosmos to be a CSA competitor.

324. **ALGOR.** ALGOR offers numerous FEA packages comprised of several solutions depending on the user's needs. For example, the ALGOR PROFESSIONAL MULTIPHYSICS Core Package "includes capabilities for static stress analysis with linear and nonlinear material models, Mechanical Event Simulation with linear and nonlinear material models, steady and unsteady fluid flow analysis with turbulence, steady-state and transient heat transfer analysis, electrostatic analysis and linear dynamic analysis." RX 719. CSA's Dr. Swami considered Algor to be a CSA competitor.

325. **NISA.** NISA is an FEA solver offered by EMRC. NISA can be used to perform, *inter alia*, static, eigenvalue, modal dynamic, and direct transient dynamic analysis. RX 727. Dr. Swami testified that "all Nastran, ANSYS, ABAQUS, NISA, MARC, ALGOR, COSMOS, everybody will perform the static stress analysis or the vibrational analysis or the nonlinear analysis of an entity like an aircraft or an automobile or any general mechanical structure." Swami I.H. Tr. at 71:20-25.

CSA's Dr. Swami considered NISA to be a CSA competitor.

326. **MI/NASTRAN.** MI/NASTRAN is "a proprietary version of the industry standard NASTRAN that represents the combined efforts of MACRO Industries and Schaeffer Software Systems to provide a robust and powerful PC version of NASTRAN." RX 725. Harry Schaeffer described MI/Nastran in an e-mail to Jeff Morgan, the former president of UAI, as being much like UAI/Nastran: "I joined forces with Norris Luce to create a new company, MACRO Analysis LLC and merge my NASTRAN with his which was basically COSMIC. The resulting product is probably much like UAI/NASTRAN. It competes well in performance but lacks some specialty capability that some users absolutely require." RX 2657. CSA's Dr. Swami considered MI/Nastran to be a CSA competitor.

327. **ADINA.** ADINA is a "finite element program for linear and highly nonlinear analyses of solids and structures." RX 726. As a company, Adina R&D's stated "mission ... is to provide ONE finite element program – the ADINA system – that can be used to perform comprehensive finite element analysis of structures, hear transfer, fluids, and their interactions, all in one." *Id.* ADINA is available on Unix, Linux and Windows platforms. *Id.*

## L. Internally-Developed Codes and Reduced Usage Provide Further Competitive Pressure on MSC.Nastran and Other FEA Solvers.

328. Internally-developed codes have a strong following for FEA analysis at many customers. These internal codes have been developed over time and have evolved to solve the unique problems each customer has experienced in the design process and from actual use of their end products. These "lessons learned" are then integrated into the code and cause users to place

great reliance in them. They provide a meaningful to alternative commercial-off-the-shelf ("COTS") software like MSC.Nastran and force MSC to remain competitive in terms of price, service and innovation.

329. As explained by and MSC sales, "basically the in-house code, you know, they have what I would say a hold on the business, and we would try to put together a package that would entice that customer to move to a COTS software system like MSC/NASTRAN or one of our other products, MARC or DYTRAN or whatever the case may be." T. Cully Dep. Tr. at 30.

330. MSC's top aerospace executive, Ron Dyer, testified that in-house codes are a competitive threat at virtually every account. "[T]here's many companies who still have in-house codes and who still use in-house codes. I mean, every company that I do business with has numerous, numerous in-house codes used for various activities." R. Dyer Dep. Tr. at 58.

331.

332. Some customers prefer – and some mandate – that users use the internally-developed codes rather than commercial software like MSC.Nastran as a way to save money. "Generally speaking, if you have an in-house code, there is a mandate by in-house management to use that code, and you know, they -- you know, they've developed it in-house at their expense possibly and they want their engineering groups to use that code." T. Cully Dep. Tr. at 30:22-31:1.

333. There are many examples of in-house codes that customers have developed over time – sometimes over the course of decades – that are genuine alternatives to MSC.Nastran. General Dynamics' Electric Boat Division, for example, uses an internally developed FEA tool – called VIBES – in lieu of a COTS FEA solver. T. Cully Dep. Tr. at 32:4-5.

334.

335. Other large FEA software customers rely on in-house codes. "***Boeing*** Commercial had their own in-house programs ATLAS, BOESOAR that they also continue to used to." K. Blakely Dep. Tr. at 90:20-22. "***Lockheed*** -- I know they used to have an FEA product called DIAL, D-I-A-L, I believe. And I would assume they still have it and they still use it." R. Murphy Dep. Tr. at 24:24-25-2.

336. As another example, "***McDonnell Douglas*** has developed internal aeroelastic codes and other codes to meet very unique and specialized requirements to build technical aircraft, and they have used those applications in the past" R. Louwers Dep. Tr. at 167:1-5. Likewise, ***Bombardier***, a manufacturer of business and commercial aircraft, uses in-house codes. J. Baldwin Dep. Tr. at 89:25-9:3.

337. Some companies, like ***SAAB Aircraft***, take university-developed programs, modify them, and use them internally without marketing them as commercial codes. "ACSA is a structural analysis code developed by one or more German universities. Saab Aircraft had a copy of the source code and did its own internal development and did not market that version commercially." J. Morgan Dep. Tr. at 193:17-21.

338.

339. Not only are internal codes competition for FEA solver sellers, they also are an incentive to get others to compete. Internal codes often offer access to mature functionality that has

been thoroughly validated and that FEA solver sellers can develop further and market commercially. For those customers with internal codes, sharing such codes provides them a way of getting important functionality integrated into a code with broader capabilities and greater support.

340. A central part of MSC's "total solutions" approach is to help integrate these custom tools into an environment that meets customers' needs. "[Customers] in turn share with us, you know, what they think their needs are in terms of a variety of things from new software tools, better software tools, enhanced functionality, enhanced capability, those types of things, including but not limited to working with them, as I said earlier, in these bigger-picture type of things, you know, where we're working with them in ***integration of in-house tools into their processes***, working on integration of our tools into their processes, and in some cases we integrate competitive software tools into many of our clients' processes as well." R. Dyer Dep. Tr. at 52:20-53:6.

341. Making custom, in-house software available to FEA solver vendors can result in lower prices."The collaboration in developing capabilities may or may not be at a price depending on what the client brings to the table. In some cases the client has given us in-house capability or in-house-developed tools and we certainly didn't charge them for the integration of those tools into our capability. I mean, their contribution is what they brought to the plate, for instance, in FlightLoads. Some companies, sometimes they gave us money, sometimes they gave us in-house capabilities and functionalities that they did not want to support anymore and that they wanted integrated into a COTS tool." R. Dyer Dep. Tr. at 132:7-18.

342. One example is SuperModel. SuperModel is a commercial product that MSC has today. "The origins of SuperModel come from a joint MSC/McDonnell Douglas software development effort to replace in-house commercial software called CGSA, that McDonnell Douglas had previously developed and supported. In MSC's effort to be the best total solution provider for our customers, we engaged them in a contract to replace CGSA so that McDonnell Douglas could focus on more of their core competencies and get away from developing and supporting computational CAE type software." R. Louwers Dep. Tr. at 230:19-231:5.

343. A senior MSC engineer who is responsible for critical aspects of Nastran development, testified that ***competition from internal codes causes "MSC to innovate."*** *See* O. Ibrahim Dep. Tr. at 139:13-21.

344. Even customers who believe they "need" MSC.Nastran have ways to discipline MSC pricing. For example, they can reduce the number of MSC.Nastran seats they license and use their remaining seats more efficiently. For example, a customer could switch part and other small-model analysis to their CAD-embedded solver and use MSC.Nastran solely for analyzing large models, or run several iterations in a non-MSC.Nastran solver and use verify the results by using MSC.Nastran for a final run. MSC believes that customers such as have been able to reduce the number of MSC.Nastran seats... they license by using those seats more intensely. *See* K. Barthenheier Dep. Tr. at 87:3-22; R. Dyer Dep. Tr. at 146:20-147:2; *see also* K. Versprille Report ¶¶ 46-50.

### M. MSC.Nastran Faces Significant Competition from PC-based Products.

345. Complaint Counsel and its experts write-off PC-based products from the competitive landscape without ***any*** analysis. Their position is outdated and ignores the significant increases in computing power and speed of PC's over the past five years, and ignores – again – the ***partial switching*** that cannibalizes MSC.Nastran revenues and was a core part of CSA's financial troubles. *See supra* ¶¶ 90-92.

346. Computational power, which once could only be achieved on an expensive mainframe has become available on what are often referred to as personal computers ("PCs"). As MSC's industry expert Dr. Versprille will explain, what once took a supercomputer overnight to solve, now runs on a laptop in minutes or seconds. These increases in PC computing power has impacted the FEA solver market by (a) allowing customers to replace workstations with Windows-based or other personal computers that are used primarily to conduct FEA analysis; and (b) allowing customers who already had a portion of their workforce using personal computers to "push down" FEA analysis to more employees and to do it earlier in the product development process.

347.

348.

349.

350.

351.

352. Because customers can choose to partially switch analysis from workstations to PC's, FEA solvers designed to run on PC's constrain MSC's workstation prices. One of the PC-based products that MSC.Nastran competes with is its own MSC.Nastran For Windows product

("MSC.N4W"). MSC.N4W is a PC-based version of MSC.Nastran that contains most of the features and functionality of MSC.Nastran (except for DMAP and Superelements). MSC.N4W comes with its own pre-processor, which is sublicensed from FEMAP. *See* RX 2180 ("One school of thought is that it has become increasingly difficult to differentiate MSC/N4W from our core business of MSC/N and MSC/P. That MSC/N4W is a full function system that can and does compete well with MSC/N and MSC/P but at a fraction of the price.").

353. Because MSC's Nastran for Windows contains a powerful solver that is capable of performing most of the analysis that MSC.Nastran performs and uses the same input and output formats, it competes heavily against MSC.Nastran. *See* RX 2180 ("MSC/N4W is a full function system that can and does compete well with MSC/N and MSC/P but at a fraction of the price.")

354. In short, MSC.Nastran faces much ***more*** competitive pressure today than it faced in 1999.

## IV. BY 1999, NEITHER UAI NOR CSA WERE CONSTRAINING MSC'S PRICES.

### A. Complaint Counsel's Assertion That Switching Among Nastran-Based Solvers Is Seamless Is Unsupported And Contradicted By the Evidence.

355. On November 8, 2001, Complaint Counsel represented to this Court that switching between UAI and CSA was nearly "seamless." 11/08/01 Hrg. Tr. at 12:3. Complaint Counsel's case is grounded (fatally) in its unsupported assumption that switching between Nastran-based solvers is "easy." That is the core assumption basis for Complaint Counsel's assertion that UAI and CSA were MSC's "closest substitute." Compl. Counsel's Pretrial Br. at 21. Complaint Counsel's assumption is evanescent, based on nothing more than the Gertrude Stein-like notion that, because UAI, CSA and MSC all have "Nastran" in their name, it must be easy to switch among them.[101]

---

[101] Complaint Counsel's theory that "a rose is a rose is a rose" is demonstrated by lead Complaint Counsel Abbott McCartney's questioning of Dr. Swami: "Q: What makes a solver Nastran? A: I think it is – it is really difficult to say. It is just – you know, it is just like – it's just like asking what makes Dr. Swami, Dr. Swami versus Vince. I really cannot say. It's a name and it has its attributes and someone else has their name and their attributes. . .. If there is another engineer sitting by my side, what makes Dr. Swami and what makes Joe Cole, your particular attributes, but we can both do a particular engineering task.... In the same way, all Nastran, ANSYS, ABAQUS, NISA, MARC, ALGOR, COSMOS, everybody will perform the static stress analysis or the vibrational analysis or the nonlinear analysis of an entity like an aircraft or an automobile or any general mechanical structure.... Q: Could ANSYS call itself a Nastran product: A: Why should it call it Nastran? Q: I'm

356. It simply is not true that switching among Nastran-based solvers is always – or even almost so – materially easier than switching among Nastran and non-Nastran based solvers, particularly for complex analyses, especially if legacy data is involved. There are a variety of reasons why switching among Nastran-based solvers is just as often complex and costly. As detailed below, the few customers that have tried to switch from MSC to UAI or CSA faced a daunting task.

- They had to do without or find a way to work around missing features and functionality;[102]
- They had to find a way to face the prospect that UAI and CSA inter-operated with fewer leading CAE software providers and hardware platforms;
- They had to resolve all reliability issues, discrepancies and errors.[103]

357. Customers had to convert – or rewrite – many DMAP alters they may have written. Indeed, it is surprising that Complaint Counsel is relying on DMAP as a basis for their argument that switching among Nastran-based solvers is easier than among non-Nastran based solvers. Complaint

---

just saying could it?... I'm simply trying to sort of in an efficient way find out why ANSYS couldn't call its product Nastran... A: Because ANSYS did not develop it. That's the only reason. ***Nastran has nothing inherent in the name. It is just like Joe Blow.***" Swami I.H. Tr. at 12:25-13:8.

[102] The fact that MSC continued to add features and functionalities at a much faster rate than UAI or CSA meant that the list of features that MSC supported – but UAI and CSA did not – grew every year. In contrast, the list of unsupported features between MSC and other major FEA codes, such as ANSYS, remained steady or even declined. *See* R. Louwers Dep. Tr. at 171:19-172:18 ("the capabilities that are in MSC/Nastran say after . . . 1995, have greatly improved as a consequence of technical requirements coming from our customers, and we have, as a consequence, greatly outpaced the technical capabilities of many our competitors, including UAI and CSA/Nastran, as a consequence of that investment in research and development [in] enhancing the product.").

[103] As discussed earlier, although UAI and CSA all have their origins in COSMIC Nastran (albeit from differing versions), there are significant differences in the way those codes have evolved since their point of departure. One of the inherent differences, which stem from slight differences in coding, is the fact that different codes will yield slightly different "answers" for the same problem. The reconciliation of these differences is a must-do requirement in order switch to among Nastran-based solvers.

Counsel simply does not appreciate the fact that ***the DMAP languages of UAI and CSA differed significantly from the MSC's DMAP language.***

358. As Jeff Morgan, the former head of UAI and now Vice President of Software and Business Development for MSC explained: "MSC had a more rich DMAP language than UAI had." J. Moran Dep. Tr. at 116:25-117:1. In MSC.Nastran v. 66, MSC made significant changes to its DMAP language. The issue was one of upward compatibility. Prior to v.66, it was very difficult for customers to translate their DMAPs – ***even from one version of MSC.Nastran to the next.*** In v.66, MSC reconfigured its DMAP language to text to ensure easier upward compatibility. Prior to v.66, DMAPs had to reference certain lines of code. These lines of code kept changing from version to version, as new lines were added, moved around, deleted, or modified. Version 66 provided a structure that was designed to stay relatively constant despite changes in the underlying Nastran code. This way, MSC could make significant changes to its product without forcing customers to completely rewrite or translate their existing DMAPs in the future.

359. UAI created a different DMAP technology from either MSC or CSA.[104] *See* Universal Analytics, Inc. Corporate Background, April 1995 (RX 3025) ("Other Nastran programs attempt analysis flexibility through the Direct Matrix Abstraction Program (DMAP). However, DMAP requires specialized formal training, and its primitive syntax for operating many features is simply too dated for 21st-century FEA work. To address this ***shortcoming***, UAI has developed the Advanced Programmable Executive (APEX) system for UAI/Nastran written in Fortran. Since

[104] *See* RX 3025 ("Other NASTRAN programs attempt analysis flexibility through the Direct Matrix Abstraction Program (DMAP). However, DMAP requires specialized formal training, and its primitive syntax for operating many features is simply too dated for 21st-century FEA work. To address this ***shortcoming***, UAI has developed the Advanced Programmable Executive (APEX) system for UAI/NASTRAN written in Fortran. Since Fortran is the common language among engineers worldwide, training requirements are minimized while program familiarity is increased. ***APEX replaces the 'rigid formats' of DMAP*** with a system that manages all of UAI/NASTRAN in an integrated fashion.")

Fortran is the common language among engineers worldwide, training requirements are minimized while program familiarity is increased. ***APEX replaces the 'rigid formats' of DMAP*** with a system that manages all of UAI/Nastran in an integrated fashion.").

360. CSA never invested the effort to make their DMAP structure compatible with MSC's. Thus, switching from MSC's DMAP to UAI or CSA's DMAP was often prohibitively expensive, and many time required starting over from scratch. *See infra* ¶¶ 364-372.

361. In any event, the use of DMAP is limited and declining. As commercial codes have strived to become full-service providers, the need for a customization language, such as DMAP, has diminished. Now, very few people use DMAPs. Moreover, other FEA codes also have had, and continue to develop, methods for customizing their products to customers' unique engineering problems. Thus, while ANSYS and other FEA codes do not have a feature that is labeled "DMAP," they do have means for customizing their product. *See supra* ¶¶ 164.

362. Non-technical considerations further make switching between MSC.Nastran, UAI/Nastran and CSA/Nastran anything but "seamless." As Dr. Swami explained, CSA had "not been successful at ... the places [they] have gone, so customers [must be] decid[ing] on other factors in addition to what the program can do." Swami Dep. Tr. at 40:3-20. For example, neither UAI nor CSA was able to provide customers with sufficient support or the features and functionalities they desired.[105]

363. UAI's and CSA's inability to demonstrate sound financial viability was a serious obstacle towards increasing their presence at major customers. Even as early as 1996, customers

[105] UAI and CSA also failed to provide services like training, technical support, and documentation at the level required by a major customers. *See, e.g.*, T. Cully Dep. Tr. at 209:17-21 (UAI's documentation "was of lower quality" than documentation provided by MSC, ABAQUS or ANSYS) (noting that UAI "did not have as reliable a support organization as MSC" and that "they didn't have the same level of support as MSC and other general-purpose suppliers like ANSYS and ABAQUS" offered).

1.

364. A threat is not a threat unless it is a ***credible*** threat. MSC had learned over the years that some customers who threatened to switch to CSA or UAI were bluffing, or – if they followed through on the bluff – would return soon, disappointed by CSA or UAI. As Robert Louwers, an MSC Aerospace sales representative, not uncharacteristically explained, "I did not and do not ... view UAI.Nastran or, for that matter, CSA.Nastran as credible threats to MSC.Nastran and our presence ... at any of the accounts for which I had responsibility," including most of Lockheed-Martin and Boeing/McDonnell Douglas. R. Louwers Dep. Tr. at 188:19-189:5. Where customers tried to threaten a switch to CSA or UAI as a way to exact concessions from MSC, MSC simply "wouldn't play." R. Dyer Dep. Tr. at 124:18-19.

365. Complaint Counsel rely on ***evaluations*** for its market definition. Compl. Counsel's FOF ¶ 131. But, evaluations of FEA software are common. As one of MSC's senior aerospace account executives noted, something more than just an evaluation is required to convey a credible threat (discussing each ofMSC's major competitors.) "Companies ... are always evaluating everything and they evaluate -- they have one or two of every license out there for evaluation ..., so you know, when I hear that there's competitive software licenses, I don't get too nervous because it's an everyday, all-day thing." R. Barclay Dep. Tr. at 122:24-123:6.

366. Customers' experience with CSA and UAI had been so uniformly poor that MSC did not believe that its customers would actually switch any significant usage to them. MSC's top aerospace executive, Ron Dyer, was unmoved by threats to switch. He would tell customers who threatened to switch to "[e]njoy it, use it in great health, I wish you all the success in the world, because I'm not meeting his price. And I did not ... and then they spent three weeks trying to install it to see if they could actually use it and they couldn't install it and then they call me back . I left the same proposal on the table that had been on the table when I was there before, and they signed the agreement." R. Dyer Dep. Tr. at 123:20-124:2.

367.

368. Not only would a switch from MSC.Nastran to CSA prove prohibitively expensive – requiring between four and six years to break even – also determined that CSA lacked a critical capability that needed, coupled loads analysis.[106]

369.

370. The same result followed with customers that were considering UAI.

[106] A coupled loads analysis allows the user to analyze the physical forces being imparted to a payload – such as a satellite – that has been "coupled" to a launch vehicle such as an expendable rocket or the Space Shuttle.

371.

372. Complaint Counsel looks to accounts that ***merely evaluated*** CSA or UAI as proof of actual switching. The truth is, however, that accounts like

would either evaluate and reject, or dump CSA or UAI after a short period of time.

## V. THE ACQUISITIONS OF UAI AND CSA FURTHER MSC'S PROCOMPETITIVE PLAN TO PROVIDE FULL-LINE ENGINEERING SOLUTIONS.

373. The acquisitions of UAI and CSA provided MSC with two small, but readily identifiable and highly qualified teams of experienced developers. These developers had already worked out the "logic" of some features and capabilities that MSC had not yet incorporated into its own code, and provided a source of manpower that would enable it to meet its growing list of specialized projects.[107]

374. Specifically, the UAI acquisition provided MSC with access to a team of 9 highly qualified developers. The CSA acquisition provided MSC with access to an additional team of 8 developers. Since the acquisitions, these developers have invested over 56,000 hours of

[107] Tom Curry, MSC's former CEO, testified at his deposition that he also saw the value of UAI being its development staff. *See* T. Curry Dep. Tr. at 217:1-219:19 ("[w]e'd be picking up the people that had developed the features.... I don't know about the codes, whether we could just take them as they were or they would have to be ported.... [But] the features were worked out, the logic of how to do it, and so forth, and that we would get, but then it was really ***the people*** that would give us the extra development capacity that we were looking for.").

development time. Indeed, Complaint Counsel admits that the acquisitions allowed MSC to significantly enhance its MSC.Nastran product. Compl. Counsel's FOF ¶¶ 487-491.

375. Not only did the acquisitions allow MSC to improve the speed and quantity of its development effort and to enhance its customization and service activities, it also benefitted customers by integrating additional functionality into a single code. For example, UAI had developed a specific application for gaskets at Chrysler. MSC is now adding this capability to MSC.Nastran, and it will be made available to a broader customer base, at lower prices. J. Morgan Dep. Tr. at 152:24-153:1.

376. UAI's and CSA's employees have been put to significantly more productive use than if the acquisitions had not occurred. MSC has an established sales force, financial resources for development and support, and a significantly larger customer base to which it can sell and market new or improved products or services. Thus, MSC's acquisitions preserved and enhanced UAI and CSA assets and employees as a productive part of the overall market.[108]

## VI. THERE WERE NO ANTICOMPETITIVE EFFECTS AT ANY OF THE CUSTOMERS ON THE FTC WITNESS LIST.

### A. CSA and UAI Did Not Constrain MSC's Prices In the Automotive Industry. Competition in this Industry Was and Remains Fierce. The Only Effect of MSC's Acquisition Is Improved Products and Services.

377. Complaint Counsel's reliance on three auto OEMs and Caterpillar to prove its "automotive case" is consistent with Complaint Counsel's myopic focus. If Complaint Counsel expanded its vision beyond these three auto companies it would see that Porsche, DaimlerChrysler

[108] The benefits or efficiencies of MSC's acquisition of UAI and CSA can be quantified in a number of ways. One way is evaluate the value of the UAI and CSA developers obtained as a result of the acquisitions; reasonable estimates show that the value of obtaining the average UAI or CSA employee is between ***$1 million and $1.3 million***. *See* MSC's Interrog. Resp. No. 26; see *also* F. Perna Dep. Tr. at 152:6-153:18 (An "experienced, competent engineer has a replacement value, in my experience, of a million dollars.... If you get an engineer that you have to hire for a hundred, hundred fifty thousand, you know, by the time you teach them and they gain all the experience necessary to be a real producer, it takes four to five years ... if you're going to get an engineer that also knows analysis and other combinations, combination engineer-programmer.... If you start out, you don't have that. You've got a person that has potential. And by the time he reaches that potential, it takes about four or five years.").

(Germany), Audi, and Volkswagon have turned to Permas. RX 1226. Moreover, commercial vehicle (*i.e.*, heavy trucks) finite element analysis requirements mirror those of the automotive OEMs. These heavy truck manufacturers use a variety of other (non-Nastran) FEA software. Similarly, the heavy equipment manufacturers use other FEA software. And a category ignored by Complaint Counsel, the 50 Tier One auto parts suppliers use numerous FEA tools. RX 2497.

378. It is clear that ***UAI and CSA were not players in the automotive industry*** at the time of their acquisitions. As shown already, CSA had been removed from Ford and had two small automotive accounts. and served only two other accounts, Bosch and Caterpillar. Neither UAI nor CSA were constraining MSC's prices pre-acquisition and ***none*** of MSC's auto industry customers' prices increased post-acquisition.

379. MSC.Nastran is used for a variety of purposes in the automobile industry. Most, if not all, of those uses do not require software anyone would delineate as "advanced" Nastran. In general, auto companies use MSC.Nastran for noise, vibration, and harshness (NVH), durability, and powertrain analysis.

380. ***NVH*** is the largest area of MSC.Nastran use for the automakers, accounting for as much as 75-80% of CPU time.[109] In the NVH area, MSC.Nastran (mainly solutions 108, 111, and 200) is used for acoustical analysis, *i.e.,* how quiet is the ride of the vehicle? Some of the data generated by MSC.Nastran is fed into other programs, such as Sysnoise or Akusmod to do more sophisticated acoustical analysis. Some lower frequency acoustical work is performed within MSC.Nastran.

381. NVH involves several different types of analysis, including normal modes (also known as real eigenvalue analysis); dynamic analysis, including frequency and transient analysis; and acoustics. Models for NVH range from component parts to sub-systems to Body-in-White (BIW), or full vehicle models. Analyzing full vehicle systems is the most demanding of these analyses.

---

[109] While NVH represents 70-80% of CPU time for Nastran usage, the largest use of CPU time generally is in crash analysis, where LSTC's LS-DYNA has a 50% share. *See* RX 2883 (stating that 70% of GM's CPU time is dedicated to crash analysis);

382. There are a number of codes that can do NVH work on components and systems, including ANSYS, ABAQUS, Permas, ELFINI, SDRC, Algor, Cosmos, Nisa, NE.Nastran, and AI*Nastran. "Permas, CDH, LSTC and ANSYS [are] all positioning themselves to get the bulk of Linear Statics work Nastran currently does." RX 2839.

383. MSC.Nastran also faces intense competition for full vehicle systems NVH analysis. CDH/AMLS and Permas are two of many solvers that can do this work. *See* D. Roach Dep. Tr. at 270:17-25; RX 2832.

384. Both CSA and UAI were seriously deficient in large model NVH analysis relative to MSC.Nastran. Chrysler tried UAI, but found it prohibitively slow.

Although CSA worked hard to solve large NVH problems quickly, it did so at the expense of the quality of the answers. *Expected Test. of B. Hart*; *see* RX 1036.

385. ***Durability*** analysis measures fatigue, *i.e.*, when the part will fail. Again some analysis is done within MSC.Nastran and the resulting data is fed into other programs, such as (MSC.Fatigue, FE.Fatigue, FE/Safe) for further analysis. Durability analysis is performed on components, sub-systems, and full vehicles. The initial analysis is not as complex as NVH for full-body systems and numerous codes are available for this work: ANSYS, ABAQUS, AI*Nastran, Permas, SDRC,

386. ***Powertrain*** analysis involves many different types of analysis, including both linear and non-linear, and auto OEMs use many different types of solvers in this space.

. ABAQUS has been particularly successful in the powertrain area throughout all of the automotive companies. *Expected Test. of D. Roach.*

387. As the movement towards using fewer codes to solve more problems grows, MSC stands to lose even more MSC.Nastran business. As already explained,

And MSC has acknowledged that its position with automotive customers is constantly under attack with the risk of "acceptance of Altair, HKS, LMS, MDI, Permas, ANSA, Animator and CAD vendors as having superior automotive content and expertise." RX 2616.

**1.**

**a. CSA's Position At Was Unique.**

388.

389.

390.

391. Despite this significant support, the development of CSA's code was slow going. A letter from Mr. Kurudiyara to CSA in 1995 stated that, despite CSA's recent development efforts, "a lot of work is still remaining to be done to make CSA.Nastran real competition to MSC.Nastran for all of Ford's analysis needs." RX 166. Not surprisingly, during this same period of time, Ford did not utilize CSA/Nastran, ***MSC.Nastran was Ford's primary FEA solver.***

392. Because of CSA's limited capabilities, it was never able to expand its automotive customer base beyond Ford. ***Neither GM nor Chrysler ever used or even considered using CSA.*** CSA itself admitted that they had been shut out of GM and Chrysler noting that they had "been unable to penetrate for 5 years or more." RX 190.

393. CSA's inability to infiltrate the automotive market beyond its toe-hold at Ford is further reflected by the experiences of MSC's sales department. As Automotive Sales Representative Todd Brown explained, "for me personally only at Ford was CSA a direct competitor." T. Brown Dep. Tr. at 36:3-21. Bruce Hart, a long-standing MSC account representative, described the ***episodic nature of CSA's competition*** in the automotive industry even more emphatically, stating that "[o]ut of eleven years and hundreds upon hundreds of sales campaigns, I had run in to them [CSA] just ***very few times***." B. Hart Dep. Tr. at 96:19-23. He never considered CSA an actual threat even at Ford, noting that "personally I didn't think they [CSA] were a very viable alternative to us [MSC]." *Id.* at 98:13-14.

**b. Use of CSA Was Extremely Limited.**

394.

395.

396.

397.

**c. Begins to Phase-Out CSA Pre-Acquisition.**

398.

399. financial burden in supporting and funding one FEA tool while using another becomes even clearer when viewed along side the other "Big 3" auto manufacturers' costs for 1995-1996. spent approximately annually for CSA and MSC.Nastran.[111] In contrast,

110

[111] This figure does ***not*** include the nearly $2.6 million in requested development funding Ford received from CSA during the 1995-96 period. RX 1329; RX 1327; RX 1326.

spent annually for an unlimited use MSC.Nastran license which included North America and certain global locations. RX 3000 ( was paying roughly annually for its unlimited use MSC.Nastran license and an additional $240,000 per year for an unlimited license of UAI/Nastran (utilized almost exclusively for a specialized head-gasket analysis)).

400. In December 1996, ***chose MSC.Nastran on a sole source basis*** and entered into an 8-year, flat annual fee license with MSC for RX 1271; RX 2404; *Expected Test. of R. Radtke.*

401. In response to entreaties from Dr. Swami, Ford decided not to drop CSA for those engineers who had been using CSA. The MSC and CSA codes were not identical and switching would have been ***difficult and costly***. Notably, CSA observed that the decision to switch entirely to MSC "has caused many Ford engineers considerable frustration" as they attempted to adjust to the new code. "Users do not have sufficient time to adapt their CSA/Nastran decks to MSC.Nastran. Even if they did have sufficient time, they may not be able to adapt all of their decks to run in MSC.Nastran." RX 2886; *see also* RX 2478 (noting the "***tech hurdles***" CSA users were encountering during their transition to MSC.Nastran). To accommodate the time and technological requirements of these switching engineers, Ford "allowed a very low price" contract with CSA "for purposes of transition." CX 821. In an effort to hang on at the Ford account, CSA offered a price of $357,000 annually with no on-site or hot-line support. RX 1273. Ford's in-house engineer, who had worked with CSA since its inception at Ford, supplied all of Ford's support needs. ***Ford discontinued CSA use in Europe.*** RX 2958.

**d. Terminates its Agreement With CSA.**

402.

403. Ford knew that the perception of CSA in the marketplace would be damaged without Ford's support. CSA wrote a letter to Richard Radtke of Ford stating that "CSA efforts to sign up other prospective customers will be ***jeopardized***, because such prospective customers will wonder

why Ford cancelled CSA if CSA.Nastran is a good product meeting Ford's CAE needs." RX 1272. Despite this knowledge and its heavy investment of time and money in CSA, Ford cut its contract with CSA in half. Additionally, Ford also ceased its product development funding, which had been instrumental to CSA's survival. RX 2152.

404. In 1998, Ford solicited new proposals from both MSC and CSA for the six-year period 1999 through the end of 2004.

405. As MSC's Ford sales representatives have explained, MSC wanted to become Ford's sole Nastran supplier, because the increased volume would allow MSC to be better able to provide Ford with the technical enhancements and financial savings Ford desired. The cost for MSC to serve Ford would also decline because expensive, periodic benchmarking exercises would not be needed. As Doug Roach stated, "while CSA happened to be the technology or the product that Ford was looking at, our pricing wasn't controlled by CSA. Our pricing has always been controlled by our customers' business objectives and the fact that these OEMs have tremendous bandwidth and power and ability to make a change really anytime they want." D. Roach Dep. Tr. at 133:11-17; *see also* B. Hart Dep. Tr. at 98:24-99:4.

406. MSC believed that Ford engineers realized that MSC had a superior code and that there would be "hidden costs" with CSA. As Bruce Hart noted, "Clearly [the] MSC offering was significantly superior in terms of technology, support, global presence, and long term viability." RX 2207.

407.

408. In March 1999, knowing that CSA's financial situation was worse than it was in 1997, Ford gave CSA notice that it was canceling the contract and that CSA could expect no additional business from Ford. RX 2474; RX 2207. Ford and MSC entered into a 6-year unlimited

worldwide usage agreement for $1.25 million annually, with MSC as the sole Nastran supplier to Ford. RX 1284; RX 2473.

409. As Dr. Swami has attested, the loss of Ford – CSA's flagship customer – was a devastating blow to CSA's reputation. The industry knew that Ford had created CSA and had been its best credential.

**e. MSC Did Not Raise Prices Post-Acquisition.**

410. Ford has a six year contract with MSC. Each year the price of the contract can be renegotiated by either side. Both sides wanted this protection should usage increase or decrease dramatically. There have been two renewal periods since MSC acquired CSA, yet MSC did not use either opportunity to even attempt to raise its prices. In fact, MSC was told by Ford that Ford planned to renegotiate their contract on an annual basis and use the Ford standard "out clause," allowing for cancellation by either party with six months notice, as a way to reduce their software costs under the agreement with MSC. RX 2498.

411. Ford and MSC did have a ***misunderstanding*** about the coverage of the 1999 contract, specifically, a dispute as to the treatment and contractual ramifications of Ford's purchase or divestiture of subsidiaries under the MSC Software Licence Agreement. the position that Volvo, Mazda, and Land Rover were covered by the world-wide usage, although Ford later admitted that it had "***never*** really considered Volvo to be a part of the February 1999 proposal." RX 2494. Volvo, Mazda, and Land Rover each had independent contracts with MSC, and it was MSC's position that these existing contracts were valid. RX 2167. At no time had the parties discussed including Volvo or Mazda in the 1999 proposal and Ford did not purchase Land Rover until ***after*** the proposal had been signed. The parties agreed that there was a difference in interpretation of the controlling language: "This is a contract dispute that we came to agreement with, Ford Motor Company mutually agreed contract and price to include everything that they wanted to include." B. Hart Dep. Tr. at 244:17-21.

412.

Ford and MSC reached an ***amicable solution*** and folded these firms into the world-wide contract. RX 2258. The final agreement, which included Mazda, Volvo and Land Rover represented a revenue-

neutral annual fee of

*Id.*

413. Ford and MSC recently amended the agreement negotiated in 2000 to add Getrag Ford Transmission, a 50/50 joint venture between Ford and Getrag, to the unlimited use global license. RX 2258.

414. In an effort to provide Ford with further cost savings, MSC proposed in July, and again in November of 2001, that Ford convert its annual lease license into a ***paid-up license***. MSC predicted a savings to Ford of

RX 2854.

RX 2844.[112]

415. At no time, pre- or post-acquisition, has MSC raised its prices to Ford.

RX 2184.

**f. Has Multiple Alternatives to MSC.**

416.

417.

418.

[112] Although Ford declined MSC's paid-up proposal, the decision was far from unanimous: "there was internal debate, some thinking it was an excellent business move for Ford and others who said let's wait." D. Roach Dep. Tr. at 144:2-4.

RX 306; RX 364. It is not surprising then that MSC has heard "strong rumblings" that ANSYS has been undercutting MSC pricing at Ford. RX 2148.

419. Ford is also in a position to do just what it did with CSA – ***fund a competitor*** – should it feel the need to do so.

420. There has been much speculation – by MSC in particular – that Ford may have provided funding to ***LS-Dyna*** to extend its crash code into the linear static space. RX 2844.

421. Most importantly, Ford has indicated to MSC that it will not hesitate to switch partially or completely to one of these options should it become unhappy with MSC's products, services or prices.

**2.**

422.

423.

424.

425.

426.

### 3. Threatened and Did Switch from MSC.

427.

---

113

428. MSC never considered UAI or CSA as competitive threats to the GM account. Tom Curry, MSC's CEO until late 1998, stated, "I really didn't see CSA or UAI as being competitors there." T. Curry Dep. Tr. at 180:2-23. Similarly, Bruce Hart testified that, in the one negotiation he was involved in with General Motors, UAI and CSA "had no bearing whatsoever" and that MSC's negotiation with GM did not "depend[ ] on anything to do with CSA or UAI." B. Hart Dep. Tr. at 112:6-25.

429.

430.

431.

432.

433.

GM's selection of an ANSYS product for "up front" engineering illustrates that ***MSC.Nastran is vulnerable*** not only to competition from other solvers but also to changes in the ways MSC's customers configure and use other CAE tools, including preprocessors and CAD software.

434.

435.

436. When GM entered negotiations with MSC in 2000, GM made it clear that its corporate policy was to receive significant discounts from all suppliers and that "GM expects the

[114] MSC's senior manager responsible for training has testified that the ***better practice*** is to go back and ***re-do old models***. "[I]t's often a good idea to just say all right, start fresh, and instead of trying to go back and dig through the history of what did that guy do, what was his intent fifteen years ago, ... it's very easy to read things in that may have not been there based on the intent of the individual, so I always recommend ... do not use -- just don't go grab an old model and rerun it, especially if it's very old at all . ..." D. Dimas Dep. Tr. at 37:24-38:12.

final price to be at or near an " RX 2135.

437. GM's Tom Tecco told MSC that he expected the UAI and CSA acquisitions to make MSC more efficient, the end result being lower MSC.Nastran prices for GM. RX 2483.

438. GM is not shy about using the threat of switching. Specifically, when GM was not satisfied with MSC's initial offer in 2001, it told MSC that GM's Allison Transmission and Electromotive (EMD) divisions "***will use ANSYS only (No Nastran)***." RX 1042; *see also* RX 1059.

439.

440.

[115] The two-year term of the final agreement is "***GM's choice***" (*i.e.*, not what MSC wanted). Tom Tecco said, "let [MSC] know that they were not important to [GM]."

441. GM made the threat of partial switching even more concrete by threatening to switch to a limited use license. Specifically, on August 10, 2000, MSC presented GM with a global, unlimited usage Nastran license proposal at an annual cost of RX 1046. GM responded that it "is not interested in an unlimited usage model." RX 1043. ("We only want to pay for what we use").

442. ***GM ultimately received significantly more usage for significantly less money.***

*Id.; see also* RX 2184. Despite the cost reduction, several GM units (Saab, Opel, and GM Brasil) were allowed unlimited access to Nastran for the first time. RX 3081.

**4.** .

**a. UAI Was a Niche Player at and Did Not Affect MSC's Pricing.**

443.

[116] Not only did GM ultimately receive "more for less," GM informed MSC during the negotiations that it ***expected*** more for less. RX 2882.

444. Chrysler does not believe that having UAI on-site ever gave it pricing leverage over MSC, or that MSC lowered its price because it knew Chrysler had UAI. The one exception was – ***in 1990*** – when Chrysler forced MSC to change from CPU pricing to annual lease pricing.

445. MSC never believed that UAI affected its pricing at Chrysler. MSC knew that UAI's usage at Chrysler was limited to a "niche" head gasket analysis application, a type of analysis MSC had never even performed. ***UAI took that business from ABAQUS.*** B. Hart Dep. Tr. at 260:11-13; *see also* RX 2654. Even in UAI's own proposal to replace MSC, UAI admitted that it would take four years for UAI to replace MSC. For this reason, UAI never factored into MSC's pricing or contract negotiations at Chrysler.[117]

**b. UAI's Usage at Was Declining; UAI Was On the Verge of Being Eliminated.**

446.

447. UAI's only and limited usage at Chrysler was for its unique head gasket analysis, primarily a non-linear function and ***still used at Chrysler today***. As noted, UAI replaced ABAQUS for this work, not MSC.

[117] Chrysler was unimpressed with UAI's four-year plan to replace MSC.Nastran. When asked if he knew why Chrysler rejected the proposal, Jeff Morgan stated, "[Chrysler] did not tell me why they rejected it. My recollection is there was simply ***no response***." J. Morgan Dep. Tr. at 99:21-22.

448. UAI's usage continued to decline. In August 1997, almost a year and a half prior to MSC's acquisition of UAI, engineers at Chrysler began evaluating whether to renew their license with UAI.

449. Well before MSC's acquisition of UAI, Jeff Morgan, then-President of UAI, feared that UAI would lose the Chrysler account because of declining use and UAI's inability to meet Chrysler's demands. J. Morgan Dep. Tr. at 58:21-25, 122:25-123:1-6. UAI's internal "State of the Company" presentation in 1998 noted that Chrysler was one of many ***"Problem Customers."*** RX 2653.

**c. Believes the FEA Market Is Very Competitive.**

450.

451.

452.

453.

As MSC observed, "with [Permas'] current acoustic capability, they beat us easily and open another door to replace Nastran step by step." RX 2673.

454. MSC takes the Permas threat at DaimlerChrysler, and elsewhere, very seriously. MSC is well aware that ***this threat is "strong."*** RX 2634; *see also* RX 2674. To that end, MSC has undertaken benchmarks against "best-in-class" Permas in response to competitive pressure at Daimler Chrysler and other accounts, such as Porche. RX 2157; *see also* RX 2634. MSC further recognizes that DaimlerChrysler has "spent considerable effort ... finding and/or creating a possible replacement for MSC.Nastran," Permas being among the many candidates. RX 2843.

455.

456. Just as MSC recognizes the threat Permas poses to its position at Chrysler, MSC sees CDH as competitive pressure. MSC is competing vigorously to "eliminate CDH and AMLS usage" in Chrysler account. RX 2497.

MSC's technical representative stated, "[a]s I had feared, there is more widespread production use of AMLS at DC." RX 1245.

457.

lending legitmacy to MSC's fears that ANSYS is undercutting their prices in the Chrysler account.

458.

This fact is not lost on MSC, who is well aware that Chrysler "is always considering our [MSC's] competition." RX 2873; *see also* D. Roach Dep. Tr. at 268:6-13.

**d. Prices Have Gone Down Since the Acquisitions; MSC's Products and Services Have Increased.**

459. Chrysler's prices have ***decreased*** since MSC acquired UAI and CSA.

RX 2466.

Therefore, Chrysler's total Nastran costs have ***declined*** post-acquisition. B. Hart Dep. Tr. at 267:4-7; RX 2466.

460. Each year of the MSC/Chrysler contract provides a renewal, giving MSC the opportunity to raise its prices. MSC has never attempted to do so. To the contrary, Chrysler

***unilaterally imposed a 5% price reduction all of its suppliers*** but exempted ***MSC*** – because – Chrysler was so pleased with the fact that there had been no MSC price increases during the term of the contract. RX 3016; D. Roach Dep. Tr. at 194:1-5, 12-14.

461. Chrysler believes that MSC.Nastran has improved since the acquisitions. Chrysler (John Hirshey) told MSC that 2000 had been "the best year ever, since I have worked with MSC [10 years]." RX 2821. MSC saved Chrysler $10 million by developing parallel processing, which has approximately doubled the throughput of Nastran jobs and dramatically increased efficiency. RX 3015. UAI had promised to deliver this in April 1999 – but had not. MSC followed through, completing the parallel processing development project and delivered this additional capability at no additional cost to Chrysler.

462.

463.

**5.**

464. It is puzzling why Complaint Counsel would cite to Caterpillar for any aspect of its case. As Complaint Counsel is well aware, UAI replaced MSC in ***1989***, not 1998. RX 1199. At the time of the acquisition of UAI, two Caterpillar divisions were still using MSC.Nastran, and Caterpillar was looking forward to the synergies created by the merger. RX 1194; RX 1187. Significantly, MSC kept its prices at the UAI level post-acquisition. RX 2138; RX 1186.

465.

466. Caterpillar discovered that the transition from UAI to MSC was a far less-than "seamless" process. Caterpillar was still requesting special training classes to help its UAI users convert to MSC in November of 2001, more than 2 years after the acquisition. RX 2155.

467. In 2001, MSC offered Caterpillar a proposal to switch to a paid-up licensing scheme.

### 6. The Automotive Customers the FTC Left Off Its Witness List.

#### a. Truck Companies, With Similar FEA Needs, Use Other Solvers.

468. Historically, truck companies have shown the willingness and ability to use alternative solvers. Truck companies have similar FEA needs to the automakers, *i.e.,* NVH and fatigue analysis of large structures.

#### b. Used CSA and Rejected It for Technical Reasons and Because of Its Lack of Products; Affiliates Use Non-Nastran FEA Tools.

469.

470. Freightliner soon came to recognize that CSA – neither as a company nor as a product – could serve Freightliner's needs in the long run.

471.

472. MSC is concerned about other "possible competitors who will be aiming for deeper penetration at Freightliner, particularly IBM, Dassault, PTC, Altair, HKS ...." RX 2161. MSC has good cause to want to protect its MSC.Nastran business. In September 2000, MSC lost an opportunity to sell more MSC.Nastran to Freightliner to ***ABAQUS***. Freightliner wrote, "while I appreciate your offer for setting us up with Nastran, I think we will be going with HKS ABAQUS. There are several reasons. One, ABAQUS is also a standard product used in DaimlerChrysler (Freightliner's ultimate parent) and Freightliner. It is also supported by MEDINA, the pre/post-processor used at Freightliner. The pricing for a full license, not limited to development only, is much more affordable than what you are offering us. Also, ABAQUS provides the opportunity to do nonlinear dynamic analysis, which has interesting research potential." RX 2164.

473. Recently, MSC has also been worried about ***Permas*** invading the Freightliner account. In March 2001, MSC personnel in Europe learned "that DCAG commercial vehicles in Untertuerkheim has a project in place, to replace MSC.Nastran with Permas for their main application, Schlechtweg analysis. DCAG thinks that effective Ma[y] 1, the remaining minor technical Permas issues are solved together with Intes (Permas vendor) and Permas will be used as their standard production tool, after that ... Freightliner might follow asap, in case they follow the DCAG durability methods." RX 2162.

474.

475. CSA/Nastran was ***never*** MSC.Nastran's only competitor for the Freightliner account. MSC.Nastran's competition for the Freightliner accounts has increased since MSC's acquisition of CSA.

476. Since the acquisitions of UAI and CSA, Freightliner has been impressed with the innovation from MSC. Freightliner wrote, "I looked over the Release Guide and Quick Ref. Guide [for Nastran 2001] and am ***impressed*** at the number of new enhancements which are included in this release." RX 1158.

477.

478.

**c. Conducts NVH Analysis On Large Structures and Performs Eigenvalue Analysis But Does Not Use MSC.Nastran.**

479.

480.

### d. Auto Parts Suppliers/Heavy Equipment Suppliers Use a Variety of FEA Codes.

481. Auto suppliers use numerous FEA programs: ANSYS, Algor, Nisa, ABAQUS, SDRC, Cosmos, PTC, ELFINI. *See* K. Versprille Expert Report ¶ 47-48. *See also* RX 1169; RX 1174; RX 1176; RX 1178; RX 1180.

482. ***Delphi***, the largest auto parts supplier in the world, and a former subsidiary of General Motors, uses very little MSC.Nastran. B. Hart Dep. Tr. at 136:1-13. Delphi has contemplated either not renewing or drastically reducing its license with MSC and considers MSC a "second order tool." RX 2827; RX 2830. ***Dana Spicer***, another large automotive supplier, just recently added MSC to a long list of FEA tools after having primarily utilized ***NISA*** for its solver needs. ***Federal Mogul***, another parts supplier, is primarily an ANSYS house. RX 2141; RX 2471.

483.

484.

485. Even if an automaker requires an analysis to be done in Nastran, the final output deck can be run in Nastran using Patran or another post processor, or alternatively a single license of Nastran can be used. ***Navistar*** was told by Ford to use MSC.Nastran for a project, but chose ANSYS instead. *See* RX 1046; *see also* K. Verspille Expert Report ¶ 47.

### e. MSC's Cannot Raise Prices To Automotive Customers.

486. As shown above, MSC's FEA prices remain competitive in the automotive industry because customers can and will credibly threaten to switch to other FEA solvers. If confronted with a demand for a non-cost or a quality-based price increase for MSC.Nastran, MSC's automotive sales force is fearful that its customers could (and would) switch enough – or all – of its MSC.Nastran usage to one or more other FEA solvers so that it would make any such price increase unprofitable. MSC's overall actual revenues would decline rather than increase as a result of the attempted prices increase. And beyond the critical loss of MSC.Nastran revenues, these sales representatives believe that they would lose further revenues from diminished sales of MSC.Patran and other MSC complementary software products and services.

## B. Aerospace Customers.

487. Complaint Counsel points to aerospace customers that merely ***evaluated*** CSA or UAI to suggest that CSA and UAI disciplined MSC's pricing. What Complaint Counsel omits is that those same companies – that evaluated CSA and UAI – ***rejected*** them because they were not viable alternatives to MSC.Nastran.

488. Given the end use of their products, aerospace customers were particularly unlikely to regard CSA or UAI as viable alternatives for MSC's aerospace and defense customers. Aerospace and defense firms build products that carry hundreds of passengers across oceans, engage in aerial combat at twice the speed of sound, carry satellites into space, and serve as a manned outpost in earth orbit. They are not going to put ***critical analyses*** in the hands of a small, struggling company. As two minute, visibly flailing firms, with already limited functionalities, CSA and UAI lacked the credible sustainability to make them viable competitors for meaningful portions of the FEA solver needs of these aerospace behemoths.

### 1. .

489. ***UAI and CSA have never competed with MSC.Nastran at Boeing.*** Neither company could meet Boeing's stringent financial requirements. Boeing threatened to shift MSC usage to ANSYS, but it never threatened to switch to CSA. R. Dyer Dep. Tr. at 438:13-20. Boeing never even licensed UAI/Nastran, and had only a single seat of CSA/Nastran – at Huntsville – a leftover from a single, specific, decade-long NASA project.

490. Boeing had very stringent financial conditions for its suppliers. *See* E. Jones Dep. Tr. at 137:8-9 ("proven credibility" is important to Boeing). Indeed, ***MSC***, a company hugely larger than either CSA or UAI, ***barely met Boeing's standards.***

491. Neither CSA nor UAI had the developmental budget or staff to support Boeing. In contrast, MSC is able to "collaborat[e] in tool development" and "integrat[e] tools and processes." R. Dyer Dep. Tr. at 53:14-54:6. Such collaboration is essential to Boeing. Its "Lean and Efficient" program demands "streamlined . . . processes for doing the complete design from conceptual design to manufacture of an airplane." *Id.* at 72:17-24. For instance, MSC developed DMAP routines for "rotor dynamics analysis [of] hanging engines" that cut time spent testing new engines from "as much as 88 days" to "less than one day's work," and allowed Boeing to meet its "cycle reduction goals." *Id.* at 91:7-23; K. Barthenheier Dep. Tr. at 227:3; R. Dyer Dep. Tr. at 93:11-16. UAI and CSA did not "have the ability to interface with the major aerospace accounts at a level like that" because "[t]hey did not have the staff to be responsive to those types of requests." R. Dyer Dep. Tr. at 132:19-23.

492. MSC dedicated specific resources to qualify its codes with the defense department as "viable, accepted tools to be used in the JSF [***Joint Strike Fighter program***]," a $20 billion aerospace industry opportunity for Phase I alone. R. Dyer Dep. Tr. at 182:1-8. The JSF certification process taxed even MSC's far greater resources, and would have been impossible for CSA or UAI to accomplish.

493.

[121]

494.

[122] RX 751. In fact, after nine months of work,

Dep. Tr. at 84:3-4, 246:10; RX 1820.[123]

---

118

119

120

121 RX 751

122

[123] Boeing's Huntsville, Alabama site uses CSA/Nastran for NASA's Space Shuttle/SpaceHab ("SpaceHab") program. SpaceHab generated legacy data, old models, and DMAP customizations written for CSA/Nastran. R. Dyer Dep. Tr. at 47:1-48:23.

495. MSC faces vigorous competition at Boeing from codes offered by financially secure companies: Dassault Systems' ELFINI solver, ANSYS, and HKS' ABAQUS. This ***competition is heterogeneous***; the identity of MSC.Nastran's closest competitor varies by division, by project, and with the particular analysis requirements of different tasks. E. Jones Dep. Tr. at 107:19-108:1 ("all programs ... commercial as well as military ... had multiple solutions ... whether it was Rasna or ANSYS or ELFINI"); 208:15-17 (competitors at Boeing include ANSYS, ABAQUS and ELFINI).

496. ***ELFINI is the preferred linear analysis tool at The Boeing Commercial Airplane Group ("BCAG").*** R. Dyer Dep. Tr. at 217:22-25. ELFINI and MSC.Nastran can both be used for the analysis of internal and external loads. E. Jones Dep. Tr. at 174:15-18; R. Dyer Dep. Tr. at 479:19-480:1. While in the past Boeing has used ELFINI for internal loads, on new projects like Boeing's Sonic Cruiser, MSC continues to vie for that business. *Id.*

RX 1789. By 2000,

RX 1791; E. Jones Dep. Tr. at 116:2-3, 117:19 (IBM and Dassault are BCAG' "strategic partners" while MSC is "the red haired stepchild").

497. At the outset of its development work for the JSF bid, Boeing conducted an internal competition and evaluation to select analysis software. ELFINI and MSC.Nastran were among the codes Boeing compared. Boeing initially recommended using ELFINI for external loads and MSC for internal loads, but later decided to go with MSC for both. E. Jones Dep. Tr. at 174:15-22. MSC was "excited" at the outcome of the competition, which "was a big victory." *Id.* at 175:9-12.

498. ***In other parts of Boeing, ANSYS is MSC.Nastran's toughest competitor.*** "There is plenty of ANSYS being used within Boeing and [MSC] compete[s] regularly for that business." K. Barthenheier Dep. Tr. at 249:5-7. Boeing's Rockwell and Rocketdyne divisions each have "a very large contingence of ANSYS use[rs]." R. Dyer Dep. Tr. at 144:4-9. MSC has tried, without success, to replace ANSYS at these locations, and ANSYS "is still used very heavily today." *Id.* Boeing units in Seattle and Canoaga Park and Boeing's Internal Resource Center all use ANSYS.

R. Dyer Dep. Tr. at 225:8; K. Barthenheier Dep. Tr. at 263:25, 264:12-13. MSC offered to substitute Nastran for ANSYS for floor beam analysis at BCAG, but Boeing "didn't take [MSC] up on this offer." K. Barthenheier Dep. Tr. at Tr. 264:4-8.[124]

499.

For example, in 1995 Central Engineering, JAST, and Sea Lauch, used ANSYS in place of MSC.Nastran to comply with mandated cost reductions. E. Jones Dep. Tr. at 86:18-87, 213:11-16.

500.

RX 1824. Boeing told MSC that Boeing met with ANSYS representatives to discuss ***AI*Nastran***. K. Barthenheier Dep. Tr. at 239:2-5.

501. Boeing is also likely to turn ***to ABAQUS*** for linear analysis in the future.

RX 1799. HKS has added "features and functions" to ABAQUS, and opened up the solver's linear capabilities to the point where ABAQUS can be considered "almost a new code" compared to what it was in 1999. R. Dyer Dep. Tr. at 227:23-228:2. Boeing responded promptly by displacing MSC.Nastran to use ABAQUS for linear analysis on both commercial and military projects. R. Dyer Dep. Tr. at 203:5-204:3. MSC believes that the ABAQUS enhancements are a serious and growing threat to MSC.Nastran, because "there is no need to have two codes sitting there to do the same thing." R. Dyer Dep. Tr. at 204:19-22.[125]

---

124

[125] Even before the recent enhancements, MSC had lost additional orders for Nastran to ABAQUS at Boeing. E. Jones Dep. Tr. at 212:4-25.

502. Given the competition that MSC faces from ELFINI, ANSYS, and ABAQUS, and the inability of Boeing to switch to either CSA or UAI, it is not surprising that Boeing was able to negotiate a very favorable contract after both mergers.

503. The ***three-year Enterprise Agreement between Boeing and MSC*** ("Enterprise Agreement") provides company-wide, unlimited usage for Nastran and Patran.[126] "[I]n the event that Boeing's use of included software drastically increases," the Enterprise Agreement caps Boeing's total costs at equal to the amount Boeing paid MSC under prior agreements. RX 1732; RX 3061 ("no cost increase associated with increased requirements for Nastran and Patran"); R. Dyer Dep. Tr. at 450:2-5. Yet, Boeing is allowed to earn substantial discounts by lowering the number of installations (or seats) of MSC software. In fact, while the Enterprise Agreement placed all of the risk of increased usage on MSC, it gave Boeing the opportunity to lower its costs by managing usage to reduce seats.[127]

504.

RX 3061.

"Boeing did a very good job of consolidating their licenses and managing their costs." K. Barthenheier Dep. Tr. at 87:3-5. MSC believes "Boeing is actually using more of our product; it's just that they've reduced the number of seats of what they are using." *Id.* at 86:19-22; R. Dyer Dep. Tr. at 146:20-147:2.

---

[126] Prior to the Enterprise agreement, Boeing has separate licenses with at least five Boeing divisions: (1)BCAG, (2) defense, (3) space and communications, (4) Rockwell, and (5) Rocketdyne. R. Dyer Dep. Tr. at 448:4-13. Recently, Boeing and MSC have agreed to include BSS (former Hughes Satellite) in the Enterprise agreement. RX 1793. ***Boeing acquired Hughes Satellite after entering into the Enterprise agreement with MSC.***

[127]

RX 1796;

R. Dyer Dep. Tr. at 450:13. The following year, MSC returned to Boeing a rebate of 18%, or about $1.1M. RX 1802; R. Dyer Dep. Tr. at 450:16.[128]

505. Perhaps the strongest evidence of the negotiating leverage Boeing holds over MSC the fact that MSC assumed ***all*** the risk that Boeing would "drastically" increase usage of MSC software without paying MSC any additional revenue. At the time Boeing and MSC entered the Enterprise agreement,

RX 1732.

RX 1732.

RX 1732.

506. While Boeing and MSC had not yet begun serious renewal negotiations for 2002, ***MSC intends to offer Boeing*** several proposals, including ***a choice of continuing an annual lease***, gradually transitioning to paid-up tokens over a three to four year period, or making an immediate transition to paid-up tokens. R. Dyer Dep. Tr. at 477:11-13. Boeing is currently running a pilot program to test the token licensing system. *Id.* at 477:18; K. Barthenheier Dep. Tr. at 141:17-20, 144:1-3. In light of Boeing's recent success at reducing its cost under the Enterprise Agreement, ***Boeing sees advantages to paid-up tokens.*** Tokens offer Boeing the opportunity to lower its costs by consolidating seats and switching usage to other solvers. If MSC does not offer Boeing-favorable pricing and acceptable license terms, Boeing is prepared to – and has already told MSC that it will

[128] ***Boeing is able to manage the measurement date.*** The Enterprise agreement calculates the rebate due to Boeing based on the number of seats of MSC software in July of each year. In June through September, Boeing's "usage goes way down and they drop licenses and then throughout the year they'd slowly come back." K. Barthenheier Dep. Tr. at 131:17-22. Because Boeing reduces installations on the critical measurement date, the rebate calculation is made "on the low watermark" and is not a fair estimate of the number of seats over the full year. *Id.*

– consider "other codes" after the Enterprise Agreement expires in 2002. K. Barthenheier Dep. Tr. at 260:23.

**2.**

507. Complaint Counsel's analysis of Boeing/Hughes Satellite suffers from two fatal fallacies. ***First***, Complaint Counsel contends that "[p]rior to MSC's acquisitions of UAI and CSA, Hughes was actively preparing to switch or seriously considering switching to UAI.Nastran or to CSA.Nastran." Compl. Counsel's FOF ¶ 77. Contrary to Complaint Counsel's assertions, Boeing/Hughes was ***not*** prepared to switch to CSA or UAI. In fact, Boeing/Hughes had evaluated CSA and concluded that it was ***not*** acceptable. R. Barclay Dep. Tr. at 233:9-12.

508.

509. CSA was unwilling to take the steps necessary to service the Hughes option until Hughes made "some serious financial commitment" to CSA and guaranteed CSA the equivalent of twenty-five percent of MSC.Nastran's revenue, something that Hughes rejected – for good reason. Not only would it have to fund CSA, but Hughes would have to expend significant efforts of its own. "The conversion of the DMAP would have probably taken Hughes ***roughly another man year*** to support in parallel with CSA. That would have included migrating the DMAP over and then testing it to make sure that it performed accurately." Hughes found this game not worth the candle.

510. Boeing/Hughes can offer no meaningful insight into the viability of ***UAI*** as a substitute for MSC.Nastran. Hughes had not progressed to a point with UAI where it could make any credible determination about the viability of UAI as an alternative.

511.

*Id.*

512.

513. Complaint Counsel's ***second*** fatal fallacy is the self-serving – and demonstrably wrong – proposition that Hughes' prices increased after the acquisitions. Hughes did ***not*** pay more for what it used after the acquisitions than before. In 1994, Hughes and MSC entered into a multi-year, ***unlimited use license*** agreement allowing Hughes to use an unlimited amount of MSC.Nastran for a fixed price. Such agreements are a form of risk-sharing under which the customer and MSC estimated what the customer's ***likely*** usage would be during the life of the contract and then negotiated a price based upon that projected usage.

Factors influencing projected usage could include the number of engineers, the type of computers on which the software would run (because faster computers can do more problems per unit time than slower ones), and the customer's expected business activities (*e.g.,* was it expecting to win a new project or wind down an existing one) during the contract period. If MSC underestimated the customer's ***actual*** usage over the period of the agreement, ***MSC*** bore the risk of the lost revenue. If the customer overestimated its use of MSC.Nastran over the period of the agreement, the ***customer*** bore the risk of overpayment.

514. Although these agreements are called "unlimited" licenses, they are predicated upon an expected level of usage. Thus, an unlimited use license for a customer with thirty expected full-time users would be lower than an unlimited use license agreement for a customer with one hundred or more expected full-time users, all other things being equal.

515. Hughes and MSC entered into a five year "unlimited use" license agreement that began in 1995 and was set to expire in 2000. As part of the negotiation, the parties anticipated approximately ***30 users***. R. Barclay Dep. Tr. at 242:7-14.

516. The agreement, however, allowed Boeing/Hughes to add seats of MSC.Nastran at will, with small additional costs. During the course of the five year agreement, Hughes took advantage of this to an unexpected degree and swelled its number of seats from the original thirty estimated at the time of the negotiation, ***to nearly two hundred***. R. Barclay Dep. Tr. at 244:1-3.

Each of those seats, in turn, was capable of running MSC.Nastran twenty-four hours a day, seven days a week. As a result, Hughes' available MSC.Nastran grew by ***a factor of six*** during the life of the agreement.

517. In the interim, Hughes decided to reconfigure its computer system and move MSC.Nastran from a central mainframe, to a more distributed environment in which MSC.Nastran resided on individual desktop computers.

518. When it came time to begin negotiations with MSC for the 2000 renewal, Hughes asked MSC to provide a quotation for ***220 seats*** of MSC.Nastran, over seven times the original thirty that had been anticipated in the agreement negotiated in 1995.

519. MSC warned Hughes that the method it proposed for soliciting MSC's bid would not be acceptable. R. Dyer Dep. Tr. at 483:18-484:3. The reason that Hughes sought the structure that it did, was to place seats on each computer in the organization so that ***Hughes would not have to track usage*** or spend other effort associated with administering the program. *See* R. Barclay Dep. Tr. at 242:22-25; 243:18-19.

520. MSC proposed an unlimited use license to meet Hughes' needs, but Hughes was adamant. "[W]hen we talked to them about bidding on it, they came back to us and said we don't want you to bid on an unlimited license agreement, we want you to bid on the 220." *Id.* at 245:19-23.

521.

RX 1836.

522. Soon enough, the dust settled and it became apparent that the usage configuration that Hughes sought was unrealistic. In fact, what Hughes had asked for was so unrealistic, it had sought seats of MSC.Nastran for more than three times the number of engineers that Hughes had who actually did FEA analysis. *See id.* at 252:17-24.

523. "[I]n a meeting ... Scott Spiegel, ... the manager of the analysis, couldn't understand why in this group they were asking for 220 seats of software, and that's when he said: I have a

hundred people that use the software 30 percent of the time. Why are we asking MSC.Nastran to bid on 220 seats?" *Id.* at 252.

524. Ultimately, MSC re-bid the Hughes contract. MSC gave Hughes thirty seats of MSC.Nastran for nearly the same price they had paid five years before. In addition, MSC "threw in" an additional seventy seats of MSC.Nastran ***"for convenience."***

**3.**

525. Until 1993, McDonnell Douglas Corporation ("MDC") used MSC.Nastran exclusively, except for ***a single seat of CSA*** required for a NASA project at MDC's Hunstsville, Alabama facility. RX 1765.

526.

527. In 1994, MDC purchased ***two UAI/Nastran*** seats for use on the F-18 project. UAI was selected by MDC because it offered a particular technique not available in MSC.Nastran. (R. Dyer Dep. Tr. at 106:8-108:10. MDC's use of two UAI seats on the F-18 project did not immediately cost MSC any revenue because ***MSC had an unlimited use enterprise agreement with MDC.*** *Id.*

528. McDonnell Douglas in St. Louis, used UAI for a very limited niche capability and only on a limited basis. For McDonnell Douglas' F/A-18 efforts, "[UAI was] brought into specifically help expedite the engineer team's support of what was called a static test article. A statistic test article is typically ... created after the fundamental engineering is done but prior to test flight at the early state of production for the aircraft." J. Morgan Dep. Tr. at 208:2-8. McDonnell Douglas' ***usage of UAI/Nastran was short-lived*** and went no further than a limited application to the F/A-18 program, ending "sometime in '98." J. Morgan Dep. Tr. at 215:2-5.

529. With the end-date for McDonnell Douglas' contract with UAI approaching UAI's CEO, Jeff Morgan approached McDonnell Douglas about increased purchases of UAI. The result was the indication that "there was ***no interest*** in pursuing that discussions." J. Morgan Dep. Tr. at 211:7-13.

530. UAI sought additional business from MDC and between 1995-1996. MDC evaluated UAI/Nastran. ***MDC noted substantial problems with UAI/Nastran***, including the fact that other vendors did not support UAI, limitations in the size and budget of UAI's developmental staff, and the technological limitations of UAI/Nastran.

531.

*Id.*

532.

533.

534.

535. MSC did not perceive UAI or CSA as a threat at MDC. Although MSC was aware that MDC was conducting an analysis of UAI, MDC never threatened MSC that it would switch to UAI. R. Dyer Dep. Tr. at 413:12-18. Indeed, MSC knew – as MDC learned – that ***UAI did not have the scale, integrating, training or service necessary to compete*** for the overall MDC business. R. Dyer Dep. Tr. at 120:21-121:13. As

**4.** .

**a. UAI and CSA Were Not Significant Competitors for FEA Solver Usages.**

536.

---

[129] *See* RX 2987 ("McDonnell Douglas is facing more than $1 billion in losses due to cost overruns" causing President Bush to make a "series of moves . . . to ensure the survival of the ***ailing*** McDonnell Douglas Corp."); RX 2987 (McDonnell Douglas facing "an imminent bankruptcy filing and massive layoffs").

[130]

RX 560.

at 243:21-23.

537.

538. In fact, in 1998 Lockheed Martin Aeronautics in ***Fort Worth, canceled its agreement with UAI***. "My recollection was the UAI/Nastran license expired in November of 1998" and the contract was never renewed. J. Morgan Dep. Tr. at 164:7-16. Notably, the only other Lockheed Martin account purchasing UAI/Nastran at the time of MSC's acquisitions in 1999, Lockheed Martin ***Skunkworks***, significantly ***reduced*** its usage of UAI in 1999, only purchasing ***one seat***. RX 3067.

539.

540.

---

553-

559.

131

541.

542.

at 85:5-7.

---

132

RX 534.

**b. Used the 1997 EPI to Try to Force MSC to Lower Prices by Selecting a Third-Rate "Competitor" to "Groom;" That Effort Failed.**

543.

544.

545.

---

133

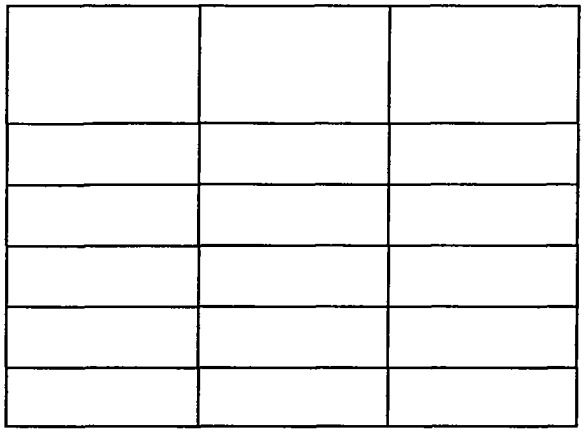
RX 529; RX 530.

546.

547.

548.

549.



550.

551.

RX 1104.

RX 1105.

552.

553.

**c. Only One Major – Purchased CSA On A Trial Basis Only.**[135]

554.

RX 2989.

---

134

[135] Complaint Counsel refers to Lockheed Martin Missiles and Fire Control - Dallas (LMMFC-D) as Vought.

136

this site's decision to use CSA was a financial one, based on price and limited functionality requirements. In other words, it did not need a solver with all of MSC's functionality, so it purchased ***a cheaper, but inferior***, tool that met its requirements. J. Baldwin Dep. Tr. at 100:21-101:11; *see also*

555.

556. Contrary to Complaint Counsel's assertion that LMMFC-D had no problems switching,

557.

---

*See* RX 2199.

558.

559.

RX 575.

**d. Prices Did Not Increase Post-Merger.**

560.

137

RX 2199; RX 691; RX 692.

561.

MSC did not raise prices at Lockheed following its acquisitions.

**e. EPI Initiated the FTC Investigation To Try to Get Even Lower Prices From MSC.**

562.

563.

138

564.

565.

566.

567.

---

139

140

568.

Compl. Counsel's FOF ¶ 298.

**5.** .

569. TRW is another case of an aerospace customer who ***evaluated and rejected CSA***. Rather than demonstrating the viability of CSA as a substitute for MSC.Nastran, TRW demonstrates that CSA was not an alternative and that the threat of switching to CSA was one that MSC found not to be credible.

570.

Complaint Counsel ignores the testimony of Ron Dyer and Rick Barclay, the MSC personnel responsible for the TRW account, which explained that this increased discount was due to efforts to reach an agreement with TRW that would lead to increased sales. *See* R. Dyer Dep. Tr. at 244:4-5; R. Barclay Dep. Tr. at 111:7-22. Indeed, the two offers clearly show that the quotation for December 16, 1997 includes consolidation of contracts that were not listed in the December 11, 1997, quotation. *Compare* RX 1589 *with* RX 1588; *see also* R. Dyer Dep. Tr. at 241:21-244:9; R. Barclay Dep. Tr. at 112:13-113:4.

---

571. TRW began the effort to consolidate its engineering software licenses in early 1997. TRW expressed to MSC, TRW's desire to consolidate its MSC contracts within the Space & Electronics Group. The desire to consolidate contracts and to thereby increase administrative efficiencies were raised ***by TRW*** as part of the negotiations with MSC for the renewal of MSC's contracts for the coming year, 1998. R. Dyer Dep. Tr. at 243:10-12.

572. TRW wanted to streamline contracting and have all of its agreements with MSC under ***one contract*** which would be renewable on the same date. "[T]here were many separate contracts in place at many different sites, and it would be beneficial to lump these all into a corporate agreement with maybe perhaps one purchase order, perhaps do a multiple-year contract to save both of our companies the cost of administering purchase orders many times a year." R. Barclay Dep. Tr. at 111:7-13.

573. MSC hoped to gain greater access to TRW's other corporate businesses as a benefit of a single corporate agreement. Another anticipated benefit to MSC was that a single agreement would have reduced the number and costs of negotiations. *See id.* at 111:4-19, 113:18-114:6.; R. Dyer Dep. Tr. 241:21-242:22.

574. MSC also believed that such an agreement would lead to increased sales of its Patran pre- and post-processor at TRW. "MSC had a limited amount of PATRAN at these accounts and there was a commitment by TRW to begin to engage in a significant amount of training to increase the use and the presence of PATRAN at the facility." R. Dyer Dep. Tr. at 243:13-17.

575. As a result, MSC provided TRW with a quotation on December 16, 1997 that included MSC contracts at several TRW sites on the West Coast.

576. As for TRW's evaluation of CSA, it was a "nonfact" for MSC. R. Barclay Dep. Tr. at 122:23-123:6.

Mr. Barclay testified that he assumed – correctly – that the evaluation must have been a failure because it did not go anywhere. "I heard through the grapevine

that it was, you know, a failure and it went away because it ***never hit my radar screen*** to track." R. Barclay Dep. Tr. at 123:9-12.

577.

CSA would often make unsubstantiated claims about its software's capabilities. *See* R. Dyer Dep. Tr. at 153:9-21.

578.

579.

**6.**

580.

581.

**7.**

582. United Space Alliance is a joint venture company formed by more than a dozen companies who provide engineering support for Space Shuttle flight operations. What USA does is

truly ***"rocket science."*** At USA's Kennedy Space Center operations, engineers perform structural analyses on a variety of things, including the Solid Rocket Boosters ("SRBs") used on the Space Shuttle. The SRBs are ignited at launch and provide a significant component of the thrust used to propel the Shuttle Orbiter into space.

583. In analyzing various components of the SRBs, USA uses both ANSYS and MSC.Nastran side-by-side.

584. As for Complaint Counsel's assumption that only Nastran can be used to solve ***legacy*** problems, the SRB finite element models were originally developed by NASA's Marshall Space Flight Center back in the 1970s.

585.

**8.**

**a.**

586. Complaint Counsel points to an account with very unique – and peculiar – history as one of its few anecdoctes to say that MSC customers paid more for MSC.Nastran post-merger.

587.

141

588.

589.

590. "The terms and conditions of the [UAI] Goddard contract ... were very unusual in that the software lease fees were based on the purchase price of the computer that the software was running on." J. Morgan Dep. Tr. at 234:7-11. This method of "Gross Asset Value" ("GAV") pricing was ultimately unsuccessful. Under Goddard's GAV scheme, when the price of computers tumbled, the price of software went after it. J. Morgan Dep. Tr. at 234:7-24. "And these purchase prices I believe were revisited on an annual basis. . . . [At] this period of time . . . PC based workstations were becoming relatively powerful, and of course were much lower price than Unix workstations so the necessary result was -- to UAI was a significant drop in revenue from Goddard Space Flight Center during the 1990s." J. Morgan Dep. Tr. at 234:12-19.

591. In fact, UAI was not even making a profit under its contract with NASA Goddard, another factor that contributed to UAI's decline. As Morgan explained, "I had no other disagreements with [NASA Goddard] other than I was ***no longer making a profit.***" J. Morgan Dep. Tr. at 236:20-21. "The drop was so significant that it was very easy for [UAI] to make an internal decision that ***[UAI] would not bid or respond to any [requests] for proposal*** under similar conditions because we couldn't afford to service the customer [under] those conditions." J. Morgan Dep. Tr. at 234:20-24.

592. Goddard recognized that they had inadvertently reaped a windfall from the unexpected consequences of its proposal structure. "And [Goddard] fully expected that when they renegotiated with UAI that UAI was going to correct that situation." T. Cully Dep. Tr. at 89:24-90:1. Goddard told its MSC account representative that ***Goddard "fully expected the combined cost of UAI/CSA to be doubling" upon renewal in 2000.*** T. Cully Dep. Tr. at 89.

593. After the acquisition, MSC converted Goddard's UAI/Nastran and CSA/Nastran to MSC.Nastran. However, in doing so, MSC did ***not*** raise its prices to Goddard; instead, MSC gave Goddard a "significant discount." T. Cully Dep. Tr. at 93:18. MSC gave Goddard a five year contract for MSC.Nastran that gradually increased over five years. However, by the fifth year,

T. Cully Dep. Tr. at 103:15-18. In addition, MSC provided Goddard other added value. *See* T. Cully Dep. Tr. at. 213 (stating that MSC allowed Goddard to continue using UAI software after the date by which MSC had announced it would no longer make UAI available).[142]

594.

595.

596.

[142] In the first four years, the percentage discount was even higher. *See* T. Cully Dep. Tr. at 92:16-93:2 (stating that "[t]he discount was figured on the last year. The first-year discount was even -- was ***significantly larger***.").

597.

**b.** .

598. For a number of years, NASA Johnson had CSA/Nastran available to it on a Cray supercomputer, the same platform that ran MSC.Nastran. NASA Johnson users were ***using CSA for "pretty basic stuff*** that was in Nastran." Engineers would only use CSA/Nastran when they "were doing stand-alone type analyses and didn't have pre-existing requirements to provide resultant models and results and in certain formats and certain capabilities with the MSC version." Simply put, Johnson was not prepared to place ***astronauts' lives*** at risk by using CSA.

599.

600.

601.

602. Nor was MSC even concerned that Johnson might be thinking about evaluating CSA or UAI. "[B]ased on our history and the things that worked with this company and the things that we could do with our software, I'm pretty confident that, you know, we could maintain the account.

And I felt pretty comfortable about that." W. Torres Dep. Tr. at 100:14-22. Rather than worry about "keeping" the account, MSC's account representative worked to provide a proposal that met Johnson's needs of moving some analysis off its Cray supercomputer in order to reduce queuing problems. W. Torres Dep. Tr. at 66:1-16.

603. With MSC, Johnson got "a lot more flexibility in running jobs." Johnson could run the equivalent of 12 supercomputer jobs on workstations. "That's 12 equivalent on the Cray. What that breaks down to is that you can run six jobs on an NT box for the equivalent of one on the Cray. So with those twelve licenses I could run 12 jobs on the Cray. I could run 72 jobs on an NT workstation...". Thus, after the mergers, ***Johnson increased the amount of FEA work it could run by as much as a factor of six***.

**c.**

604. is a facility that conducts research for the Navy's Sea Systems Command. It is a small facility, employing relatively few analysts.

605. The

606. Although Complaint Counsel points to NSWC-Carderock as an anecdote of switching from MSC.Nastran ***to*** CSA/Nastran, NSWC-Carderock's experience cannot support that proposition.

607. In fact, the Systems Directorate at NSWC-Carderock did not begin using MSC.Nastran until ***after*** the 1999 acquisition of CSA. MSC continued to allow NSWC-Carderock to use CSA/Nastran after the acquisitions ***at no charge***. T. Cully Dep. Tr. at 177:4.

608. ***Second***, NSWC-Carderock encountered ***problems converting from CSA/Nastran*** to MSC.Nastran as a result of the differences between the two codes. NSWC-Carderock has still not fully converted over from CSA/Nastran, ***three years*** after the acquisition. For those DMAP and other programs NSWC-Carderock had designed to be compatible with CSA/Nastran (as opposed to MSC.Nastran), switching between CSA/Nastran and MSC.Nastran required – and continues to require – more effort. The costs and length of time it has taken NSWC-Carderock to switch finite element models from CSA/Nastran to MSC.Nastran has been caused, in part, by the extent to which NSWC-Carderock's finite element models employed customized DMAP and other programs that interface with NASTRAN.

**9. The Aerospace Customers The FTC Left Off Its Witness List.**

609. The aerospace defense customers that Complaint Counsel does talk about are just as harmful to Complaint Counsel's case as the ones it did.

**a.** .

610.

611.

612.

613. Nor were UAI or CSA useful to Cessna as credible switching threats to get MSC to lower prices. MSC knew that CSA and UAI were not viable substitutes – and Cessna knew that MSC knew it. Indeed, MSC's top aerospace executive, Ron Dyer, knew that Cessna could not seriously consider switching to CSA or UAI. "They were using it as a bargaining point, and I wouldn't play. And then they spent three weeks trying to install it to see if they could actually use it and they couldn't install it and then they call me back. ... I left the same proposal on the table that had been on the table when I was there before, and they signed the agreement." R. Dyer I.H. Tr. at 124:17-125:2.

614. In reality, MSC was much more concerned about ***ELFINI*** at Cessna. "ELFINI is something I consider would be able to come in and take away some of the market share I have at Cessna. . . . I consider that something that is going to . . . potentially affect the revenue there. In fact, ELFINI is being used by Cessna, and they've told me that they are using quite a bit of it and that the use is on the rise." J. Baldwin Dep. Tr. at 165:4-19.

615. Rather than turning to UAI and CSA, Cessna increased its purchases of Nastran for Windows as a way to decrease its FEA costs. Cessna found MSC's Nastran for Windows to be an acceptable product,

**b.**

616.

617.

**c.** .

618.

619.

620.

**d.** .

621. Firms designing large complex structures are not ***required*** to use a Nastran-based code. The mathematics and physics underlying structural analysis are not uniquely possessed by Nastran.

622. Electric Boat builds builds large, nuclear ballistic missile-carrying submarines. It does not use Nastran at all. These submarines are hundreds of feet long, displace thousands of tons, and have very complex fluid-structure interactions.

623.

624.

625.

**e.**

626. As shown above, MSC's FEA prices remain competitive in the aerospace industry because customers can and will credibly threaten to switch to other FEA solvers. If confronted with a demand for a non-cost or quality based price increase for MSC.Nastran, MSC's aerospace sales force is fearful that its customers could (and would) switch enough – or all – of its MSC.Nastran usage to one or more other FEA solvers so that it would make any such price increase improfitable. MSC's overall actual revenues would decline rather than increase as a result of the attempted prices increase. And beyond the critical loss of MSC.Nastran revenues, these sales representatives believe that they would lose further revenues from diminished sales of MSC.Patran and other MSC complementary software products and services.

## X. THE FTC's PROPOSED REMEDY "BOGGLES THE MIND" AND IS DISPROPORTIONATE TO UAI's AND CSA's COMPETITIVE INSIGNIFICANCE

### A. The FTC's Initial Position – Forced Royalty-Free Licensing of MSC.Nastran – Is Anticompetitive And Disregards the Fundamental Concept of Proportionality

627. Complaint Counsel contends that, as a result of MSC's acquisitions of CSA and UAI, an appropriate remedy today would be for MSC to provide clones of its MSC.Nastran software to one or two competitors in the CAD/CAE industry, along with additional requirements such as disclosure of any improvements or enhancements implemented or planned by MSC, updates for some period of time, and exchange of MSC customer information. Such a remedy is disproportionate to the trivial acquisitions at issue and goes well beyond the legal limits of restoration of the competition that would have existed prior to the acquisitions, even taking the remainder of Complaint Counsel's assertions as true.

628.

629. CSA's miniscule sales were based on charging much lower prices than MSC, something that Complaint Counsel's proposed findings acknowledge. *See, e.g.*, Compl. Counsel's FOF ¶¶ 67, 69, 83. If CSA prices were much lower and yet it had only a small share of the market, that by itself means CSA/Nastran and UAI/Nastran were far inferior to MSC.Nastran (and also that there are – as shown above – significant switching costs to switch between MSC.Nastran and CSA/Nastran). Indeed, it is beyond dispute that MSC.Nastran always has been a superior product to UAI/Nastran and CSA/Nastran.

630. Even assuming that MSC.Nastran, UAI/Nastran and CSA/Nastran constitute a relevant product market (which they certainly do not), Complaint Counsel's suggested remedy goes well beyond the goal of restoring lost competition, and seeks to create a "competitive environment" that did not exist prior to the acquisitions. Complaint Counsel proposes that MSC would have to divest or share MSC.Nastran, a product far superior to the CSA/Nastran and UAI/Nastran products that provided the competition the remedy is supposed to replace.

631. Complaint Counsel's proposed remedy attempts to create two or three competitors, all of which can license MSC Nastran, all of which have access to MSC Nastran employees, all of which have access to MSC's customer lists and trade secrets, all of which can compete for on an equal basis for MSC's customers and all of which will receive MSC's updates to MSC Nastran for a period after the remedy proposal is put in place. In effect, Complaint Counsel's proposed remedy would create two or three equal competitors in the marketplace. The resulting market structure for new contract bids and renewals would be around a 50% to 50% split if two equal competitors are created and a 33% to 33% to 33% split if three equal competitors are created.

632. That the proposed remedies are both unnecessary and disproportionate is confirmed by other personnel who track and are familiar with the CAD/CAE industry. For example, Merrill Lynch has concluded that, in light of the actual marketplace, "The [FTC's] 'notice of contemplated relief' [is] an extreme and unnecessary one in our view." RX 847. Similarly, Needham stated that with regard to Complaint Counsel's proposed remedies: "This would be an extraordinary development given the fact that customers do not only shop for Nastran solvers and instead consider the full range of functionality offered by dozens of companies." RX 491.

633.

634. Complaint Counsel claims that CSA/Nastran and UAI/Nastran are now "outdated" and "stale." The fact is that these codes are still being used today. For example, ***Boeing*** Huntsville ***continues to use CSA/Nastran <u>today</u>*** and ***DaimlerChrysler continues to use UAI/Nastran <u>today</u>***. There is no question that the CSA and UAI codes are inferior to MSC Nastran today – as they were before. The reality is that, absent the acquisitions, MSC would have continued to invest much more in improving its codes than CSA or UAI ever could have. They were both out of money as shown. The large gap between the codes would have increased all the more absent the acquisitions.

635. Restoring lost competition by divesting the CSA and UAI codes would closely mirror the relative quality of the codes absent the acquisitions. Since CSA and UAI would have had less than a 2% share absent the acquisitions, even if a remedy results in the new competitors having around a 1% share, that would be far closer to restoring competition that creating a market structure where the new competitors would have a 50% or a combined 67% share of the marketplace, as Complaint Counsel demands. Significantly, Complaint Counsel assert that a sufficient constraint is already being imposed by the inferior CSA and UAI codes despite their miniscule sales. Compl. Counsel's Pretrial Br. at 24-25. If that is the standard, divesting the CSA and UAI codes will "restore" the competitive environment Complaint Counsel says is sufficient.

636. Complaint Counsel also proposes various other remedy proposals beyond the licensing of MSC.Nastran. The conditions that would be imposed because of these other proposals are designed to intensify, not restore competition – and, MSC respectfully submits, to punish MSC for declining Complaint Counsel's demands.

637.

638. Complaint Counsel's remedy proposal would require that MSC provide updates to its MSC Nastran product for some time period after the remedy proposal is put into place. This proposal would ***deter innovation*** by reducing or eliminating incentives for MSC to differentiate or enhance its MSC.Nastran product.

639.

640. Complaint Counsel's also overreaches in its position that a remedy should allow all MSC ***customers with paid-up licenses to obtain a rebate*** from MSC if they switch to the product of the supplier created by the divestiture.

641. Subsequent to the acquisitions and independent of them, MSC has made an effort to convert more of its customers to paid-up licenses, and has done so (at least in part) by making paid-up licenses less costly (offering multi-year discounted maintenance contracts, for instance). Hence, the percentage of paid-up licenses would have risen absent the acquisitions. Complaint Counsel, in fact, has made no attempt to calculate what percentage of paid-up licenses occurred only because of the acquisitions. Indeed, there is ***no*** evidence that the move to paid-up license is either anti-

competitive or results from the acquisitions. Beyond that, one cannot simply conclude that *all* customers who took a paid-up license post-acquisition would have done so absent the acquisitions.

642.

Complaint Counsel has made ***no*** attempt to analyze the extent to which the so-called "Advanced Nastran" market is "foreclosed" because of paid-up contracts entered into only because of the acquisitions. Nor has Complaint Counsel attempted to analyze the extent to which the market is foreclosed in light of the fact that to "restore competition" the new licensees need only obtain a minuscule market share. Complaint Counsel has not laid the factual predicates that rescinding post-acquisition paid-up licenses is necessary to create a sufficiently large "contestable part of the market" for the licensees to restore lost competition.

643.

644.

645.

646.

647. Finally, Complaint Counsel's recommendations overall are impractical, and would require ongoing monitoring and enforcement by the FTC. For instance, determining what technical developments are "in process" and when the technology transfer from MSC to the licensee(s) should end seems to invite dispute. Moreover, mandating what type of modifications and improvements MSC can make to its products while still maintaining an "open architecture" will be difficult. Constraints on the ways in which MSC can further develop and enhance its products may be costly to MSC as well, and may well lead to less innovation and lower quality products.

## B. Proportionate Remedies Are Readily Available.

### 1. Divestiture of UAI/CSA With Some Additional Developer Support.

648. Complaint Counsel's theory in this case is that UAI and CSA were competitive products to MSC because they contained all of the most commonly used features and were plug-compatible with MSC. They chose to ride that horse for liability and must live with the

consequences of that position for purposes of remedy. As a result, simple divestiture of the codes to a firm that has, or can hire, developers should suffice.

649. The fact that Complaint Counsel demands more puts the lie to their liability case. But even if more is required, there is no reason why that should include anything more than development support. UAI and CSA had talented developers to be sure, and during the past few years since the acquisition those developers had not been working on UAI or CSA. Therefore, the appropriate remedy, if any is required, would be simply to have MSC pay for the development that likely would have occurred but for the acquisitions.

650. As discussed above, the development on CSA's product would likely have been minimal. CSA's primary development sponsor, Ford, had terminated it contract with CSA, and CSA was having difficulty paying its bills. It is therefore likely that CSA would have reduced development expenses.

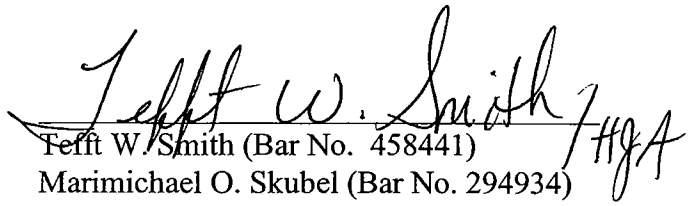
651. UAI similarly had lost some major contracts, including the ASTROs contract, had declining revenues, and was faced with the prospect of losing a number of significant customers. Therefore, it is highly probable that UAI's Nastran development would also have declined in the years since the acquisition.

**2. Developer Support for Existing Nastran-Based Competitors.**

652. MSC also recognizes that the critical question is not the identity of the companies that compete in the market, but their competitive significance. Since the acquisitions of UAI and CSA, ANSYS has developed and is in the process of introducing AI*Nastran. AI*Nastran is a product that would not have entered the market if UAI and CSA were still around. Likewise, NE/Nastran's business would not have expanded as rapidly if UAI and CSA were still around. Thus, a remedy that enhances either AI*Nastran's or NE/Nastran's ability to compete to the level of UAI and CSA (if

any remedy is even needed) should suffice. In that regard, MSC submits that, if any remedy is necessary, it need not involve anything more than some development support.

Respectfully submitted,



Tefft W. Smith (Bar No. 458441)
Marimichael O. Skubel (Bar No. 294934)
Michael S. Becker (Bar No. 447432)
Greg LoCascio (Bar No. 452814)
Colin R. Kass (Bar No. 460630)
Bradford E. Biegon (Bar No. 453766)
Larissa Paule-Carres (Bar No. 467907)
Julie Brennan (Bar No. 46684)
James Koukios (Bar No.)
KIRKLAND & ELLIS
655 15th Street, N.W., 12th Floor
Washington, DC 20005
(202) 879-5000 (Phone)
(202) 879-5200 (Facsimile)

***Counsel for Respondent***
***MSC.Software Corporation***

Dated: June 28, 2002

## CERTIFICATE OF SERVICE

This is to certify that on June 28, 2002, I caused a copy of MSC.Software Corporation's Public Version of its Proposed Findings of Fact to be served upon the following persons by:

**Hand Delivery**

Honorable D. Michael Chappell
Administrative Law Judge
Federal Trade Commission
600 Pennsylvania Avenue, NW
Washington, DC 20580

Richard B. Dagen, Esq.
Federal Trade Commission
601 Pennsylvania Avenue, NW Washington,
DC 20580

P. Abbott McCartney, Esq.
Federal Trade Commission
601 Pennsylvania Avenue, NW
Washington, DC 20580

Karen Mills, Esq.
Federal Trade Commission
601 Pennsylvania Avenue, NW
Washington, DC 20580

Hedy J. Aponte
KIRKLAND & ELLIS
655 15th Street, NW
Washington, D.C. 20005
(202) 879-5000 (tel.)
(202) 879-5200 (fax)