ARMED SERVICES BOARD OF CONTRACT APPEALS

Appeal of —	)	
	)	
Grumman Aerospace Corporation	)	ASBCA No. 50090
(on behalf of Rohr Corporation)	)	
	)	
Under Contract Nos. N00019-85-C-0004	)	
N00019-85-C-0401	)	
N00019-87-C-0131	)	
N00019-88-C-0025	)	

APPEARANCES FOR THE APPELLANT: Thomas C. Wheeler, Esq.
Barbara Rowland, Esq.
Eric B. Kantor, Esq.
Piper Marbury Rudnick & Wolfe, LLP
Washington, DC

APPEARANCES FOR THE GOVERNMENT: Fred A. Phelps, Esq.
Navy Chief Trial Attorney
Stephen R. O'Neil, Esq.
Assistant Director
Mark R. Wiener, Esq.
Robert J. Smith, Esq.
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OPINION BY ADMINISTRATIVE JUDGE HARTY

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Summary

This appeal stems from a series of prime contracts and subcontracts for the delivery of F-14 aircraft to the Naval Air Systems Command. Grumman Aerospace Corporation (Grumman) in its own right and on behalf of Rohr, Inc. (Rohr) claimed entitlement to equitable adjustments in excess of $48 million, plus interest under the Contract Disputes Act (CDA), 41 U.S.C. §§ 601-613, because of changes in the Government's inspection practices at Rohr's Riverside, California manufacturing facilities over a two and one-half year period, from January 1988 to July 1990, when new operating guidelines were adopted. One of the key features of the guidelines was a new procedure for Government quality review on a less intrusive basis and in some circumstances on a "post-audit basis." After implementation of the guidelines, the DCAS rejections of Rohr hardware and documentation declined dramatically.

Prior to the hearing Grumman and the Navy settled Grumman's $14,166,673 portion of the claimed amount. At Grumman counsel's motion, we dismissed Grumman's claims with prejudice. Rohr's sponsored claims remain. It seeks $34,050,632, plus CDA interest. For administrative convenience, we dismissed ASBCA No. 47139, the original docket number, and assigned the present docket number to Rohr's claims.[1]

Rohr claims that changes in Government inspection practices, which it traces to a change in the assignment of inspection responsibilities from one Government office to another, led to the arbitrary rejection of quality assurance procedures that had been established over 18 years of contract performance – all at a cost of millions of additional dollars, without adding any benefit or quality to Rohr's performance. The Government has acknowledged that it was responsible for some changes, while denying responsibility for others. It concedes that the changes it has acknowledged may have had some impact on Rohr. However, the Government maintains that Rohr has failed to properly segregate any additional costs resulting from those changes from other concurrent causes of additional costs for which the Government is not responsible. It points specifically to (1) Rohr's own alleged mismanagement and poor performance of the contracts and (2) Grumman's heightened scrutiny of and intervention in Rohr's performance. The Government also maintains that Rohr's use of a modified total cost method to quantify major elements of its alleged damages is unjustified.

Both entitlement and quantum are to be decided. We sustain the appeal in the amount of $7,874,702, plus interest computed in accordance with the CDA.

FINDINGS OF FACT

Background

The Navy's F-14 program began in 1969 with the award of a development contract, and ended in 1992 when Grumman delivered the last aircraft. Grumman served as the prime contractor and aircraft manufacturer and Rohr was a major subcontractor for the entire 23 years of the F-14 program. A total of 632 F-14 production aircraft were delivered to the Navy during the 23-year history of the program. (Stip. ¶¶ 1, 2; ex. A-27) Grumman regarded the F-14 as a flagship program due to the importance of the aircraft to the Navy's mission, the large quantity of aircraft produced, and the longevity and high management visibility of the program. (Llinares, tr. 2/74-75) Grumman's F-14 assembly operations were located on Long Island, New York.

Planes were purchased on a fiscal year basis. Each yearly purchase of F-14 aircraft was referred to as a lot. A separate Navy-Grumman prime contract and Grumman-Rohr purchase order exists for each lot. In Lots 1 through 17 of the F-14 program, a total of 557 F-14 aircraft were built and delivered to the Navy. (Stip. ¶ 31; Carter, tr. 1/11-12; ex. A-27) The 557 aircraft delivered in Lots 1 through 17 were known as the F-14A model. (Carter, tr.

1/119-20; ex. A-3, No. 3-16) Between Lots 17 and 18, an F-14A+ configuration was developed. The F-14A+ configuration included new engines of a different manufacturer than those installed on the F-14A model.

This appeal concerns Lots 18 through 21 (covering Government fiscal years 1986 through 1989). It involves Grumman prime Contract Nos. N00019-85-C-0004 dated 31 August 1987, N00019-85-C-0401 dated 31 August 1987, N00019-87-C-0131 dated 14 September 1988, and N00019-88-C-0025 dated 18 October 1989, and corresponding Grumman Purchase Order Nos. 18-59059 (Lot 18), 19-75913 (Lot 19), 19-84407 (Lot 20), and 19-84553 (Lot 21). (Stip. ¶¶ 9, 11, 12; Carter, tr. 1/112-13) The prime contracts also included the then applicable FAR 52.233-1 DISPUTES (APR 1984) and ALTERNATE I (APR 1984), and appropriate versions of the FAR 52.243-1 CHANGES - FIXED-PRICE clauses.

The Rohr Corporation

Rohr was founded in San Diego, California in 1940. At the time of the hearing, Rohr was the world's largest manufacturer of aircraft nacelles, pylons, thrust reversers and inlets. Rohr's products are installed on 85 percent of all 100+ seat commercial aircraft manufactured outside the former Soviet Union. From 1987 to 1990 Rohr's mix of business was approximately one-third military and two-thirds commercial. In March of 1996, the mix of business was about 10 percent military and 90 percent commercial. Rohr seldom contracts with end users of aircraft; in most cases, Rohr functions as a subcontractor to aircraft or engine manufacturers. Rohr's major customers include McDonnell Douglas, Lockheed Martin, Pratt & Whitney, General Electric, Boeing, Airbus, Rolls Royce, and CFM International. Rohr also provided solid rocket boosters for the U.S. Space Shuttle and Titan missile programs. The F-14 program was the largest military aircraft program at Rohr, accounting for approximately eight percent of Rohr's total business. (Johnson, tr. 1/47-53, 61; Hall, tr. 5/65; ex. A-3)

Rohr supplied the inlet and glove, upper nacelles, daily and weekly engine doors, ventral fins, and forward and aft fixed cowl assemblies for the F-14. There are left-hand and right-hand sets of Rohr's components for each F-14 aircraft. The inlet and glove assembly is underneath the fixed portion of the wing and contains the air ducts that supply air to the engines. The nacelle is the airframe structure that surrounds the engine. The forward and aft fixed cowl are located below the engine. The ventral fin is a blade-like structure on the bottom of the engine. The daily and weekly engine doors are maintenance access areas to allow service of the engine and are part of the nacelle assembly. Rohr's components comprise approximately 22 percent of the surface area of the F-14 airframe. (Stip. ¶¶ 4, 5, 6, 7)

Rohr manufactured the F-14 components at its facilities in Chula Vista, Moreno Valley, and Riverside, California. Rohr's largest facilities are located in Chula Vista and Riverside, California. The Chula Vista facility is where detail parts are made for installation

on other Rohr components. The Chula Vista facility is also Rohr's corporate headquarters. The Riverside facility is where metal and composite bonding and final assembly are performed. Riverside is approximately 65 miles east of Los Angeles, and Moreno Valley is approximately 12 miles east of Riverside. Chula Vista is a few miles south of San Diego and about 100 miles south of Riverside. (Stip., ¶ 8; Carter, tr. 1/110, 119; Johnson, tr. 1/51-52; ex. A-3, Nos. 3-4(a), 3-4(b))

Rohr assembled the inlet and glove, ventral fins, and daily and weekly access doors of the nacelle at the Riverside plant. The nacelle and forward and aft fixed cowl were assembled at the Chula Vista plant. Completed components were shipped to Grumman for final assembly of the aircraft. (Carter, tr. 1/116-19; Roadick, tr. 4/38-39; ex. A-3, No. 3-15)

Rohr's F-14 Program Pricing

Not-to-exceed prices for Lots 18 through 22 of the F-14 program were established in a 23 July 1985 Memorandum of Understanding (MOU) between Rohr and Grumman. Under this agreement, a not-to-exceed price of $2,300,000 per shipset was established for each annual purchase of Rohr's F-14 components, provided that the quantity of aircraft ordered was within a range of 12 to 24 for Lots 18 through 21, and 12 to 36 for Lot 22. The MOU contained an option to extend for an additional five years at the not-to-exceed price of $2,300,000 per shipset, subject to provisions for economic price adjustment, provided that the quantity of aircraft ordered was within a range of 12 to 36.

Rohr's price in the 23 July 1985 MOU was based on Rohr's historical experience in performing the F-14 program, and on the assumption that Rohr would continue operating in the same manner in the future, including the level of Government inspection oversight. (Ex. A-30; Leslie, tr. 5/135-38)

Rohr's Manufacturing Process

Rohr developed the technology for the design, tooling and manufacture of the F-14 components at the beginning of the program in the late 1960s, and did not materially change the technology over the life of the program. The engineering drawings were hand-drawn and tooling masters were made by transferring the drawings to a metal or plaster medium. Computer-aided design techniques were not used. (Carter, tr. 1/134-35; Baker, tr. 11/207)

Rohr built its F-14 components using two primary manufacturing processes: a metal bonding process in which aluminum and titanium detail parts were joined together with adhesive materials to create bond panels; and a mechanical assembly process in which components and subassemblies, including bond panels and other aerospace structures, were assembled through a mechanical fastening system. The fastening system involved the hand-drilling of close tolerance holes and the installation of high strength fasteners and bolts.

The various mechanical assembly operations were performed at Riverside on the F-14 major assembly line. (Roadick, tr. 4/17, 20-23)

The bonded panels are a sandwich-type structure in which the two outer skins are attached with adhesives to a honeycomb core. On the F-14 program many of the components have an aluminum honeycomb core and a titanium outer skin. It was the only program at Rohr in which titanium was sandwiched with aluminum core material in the adhesive bonding process. Titanium is more difficult to work with than aluminum or steel materials and requires that special steps be included in the manufacturing process. Titanium was used more extensively on the F-14 components than on any other Rohr military aircraft program. (Carter, tr. 1/145-46; Baker, tr. 11/208; Thompson, tr. 10/233)

Rohr performed the metal bonding operations at the Riverside facility in the Metal Bond Shop, one of Rohr's common shops. A common shop is a manufacturing department that provides similar parts or services to all of Rohr's military and commercial aircraft programs. The manufacturing steps in the Metal Bond Shop consist of: (1) Core Fabrication, where the honeycomb core is stretched and cut to the proper size; (2) Prefit, where all of the pieces for the bond panel are brought together to be sure they are cut and formed properly; (3) Clean Line Processing, where the parts of the panel go through a series of processing tanks to prepare the surface of the part for bonding; (4) Spray and Bake, where the parts are sprayed with adhesive primer and then baked to cure the primer; (5) Lay-Up, where the parts are fitted together and adhesive is applied between the parts; (6) Bagging, where a plastic bag is wrapped around the part and a vacuum is applied to assist in holding the parts together; (7) Autoclave Cure, where the assembly is brought into a large oven under specified pressure and temperature for a prescribed time period; (8) and Post-Bond Processing, where the plastic bag and any excess adhesive material are removed, and the part is inspected for bond integrity. The atmosphere of the Metal Bond Shop is closely controlled for temperature, humidity and dust particles. (Thompson, tr. 10/234; Carter, tr. 1/143-51; ex. A-3, Nos. 3-23-30)

The Rohr F-14 components contain approximately 20,000 close tolerance holes that are used in joining parts together in the assembly process. A close tolerance hole typically has a tolerance of plus or minus .0015 inch. Approximately 16,000 of these holes were hand-drilled by Rohr's floor operators. Templates were used to set the locations of the holes, but the actual drilling and reaming of the holes was done by hand. Plug gauges and blade gauges were used to inspect the holes. The drilling of many of the close tolerance holes was made more difficult by problems of limited access. Special tools were needed to drill and inspect the limited access holes. (Roadick, tr. 4/17-18, 25-26, 34-36; ex. A-4, Nos. 4-33, 4-34, 4-36, 4-40)

Weight is an important consideration in aircraft design and manufacture. It was particularly important in the case of the F-14 aircraft and many weight saving criteria were incorporated into the aircraft design. The F-14 weight requirements were far more stringent

than in any other military aircraft program that Rohr had previously performed. Rohr's objective in building F-14 components was to achieve the closest possible minimum tolerances in order to reduce the weight of the parts. (Carter, tr. 1/125-26, 131; J. Wilson, tr. 3/186-87; Thompson, tr. 10/221-25, 229-30; exs. A-8, -427, -428)

Government Inspection Responsibility

Since the beginning of the F-14 program, the Naval Plant Representative Office (NAVPRO, now Defense Plant Representative Office or DPRO) provided Government inspection oversight at Grumman, while the Defense Contract Administration Services organization (DCAS, or the Defense Contract Management Command or DCMC and now the Defense Contract Management Agency), provided inspection oversight at Rohr. (Stip., ¶ 16) DCAS operated under Letters of Delegation from NAVPRO, so that the NAVPRO office would not have to place inspectors in Rohr's facilities. (J. Wilson, tr. 3/154-55)

Rohr's Quality Assurance System

Rohr employed planning and floor control documentation to monitor its F-14 manufacturing processes. "Planning" refers to the written work instructions used by Rohr's mechanics and operators to perform the build operations in a sequential fashion, while "floor control documentation" refers to supplemental data kept at work stations on the production line. The planning documents are called Assembly Shop Orders (ASO). For one inlet and glove unit, a complete set of ASOs consisted of 56 books. For each component, the ASO contained information about the drawing and planning history, the bill of materials, the tools required, the work instructions for each operation, and the quality inspection operations. The ASO package also contained documentation about the repair record or other disposition of any defects that may have occurred during the manufacturing process. The ASOs moved with the unit from cost center to cost center as the component was being built. (Roadick, tr. 4/41-49, 50-52; ex. A-446)

All of Grumman's contracts with the Navy included the FAR 52.246-21 INSPECTION OF SUPPLIES-FIXED PRICE (JUL 1985) clause (with the exception of the first contract which contained the April 1984 version of the clause) and the FAR 52.246-11 HIGHER-LEVEL CONTRACT QUALITY REQUIREMENT (GOVERNMENT SPECIFICATION) (APR 1984) clause. The later clause required compliance with Mil-Q-9858A, 16 December 1963, as amended 7 August 1981.

Grumman's contracts with Rohr required Rohr's quality assurance program to comply with MIL-Q-9858A. MIL-Q-9858A contains the general requirements for the institution of a process to monitor and control engineering, purchasing, manufacturing and inspection operations. During Rohr's performance of the F-14 contracts, it had a quality assurance system designed to comply with MIL-Q-9858A on both its military and commercial programs. MIL-Q-9858A contemplates that a contractor will have a system for the

identification and disposition of material. (J. Wilson, tr. 3/154; ex. A-5) Rohr implemented the requirements of MIL-Q-9858A through its Quality Assurance Department Instructions (QADI). The QADIs established the policies, procedures and criteria on how the quality assurance operations would be conducted within Rohr. The QADIs consisted of a detailed set of requirements that were applicable to all Rohr personnel. (Stip., ¶ 13; J. Wilson, tr. 3/154, 166-68; exs. A-5, -430, -431)

MIL-STD-1520 is a key Government specification governing quality assurance. MIL-STD-1520 was not included in any of the four Grumman - Rohr contracts at issue in this appeal. MIL-STD-1520 was not included in three of the four Grumman prime contracts at issue in this appeal. It was included only in Contract No. N00019-88-C-0025, covering the last fiscal year in issue here. There have been revisions to MIL-STD-1520, of which MIL-STD-1520A is pertinent to our consideration. Rohr has asserted that it nevertheless complied with MIL-STD-1520A at the time of its performance of the F-14 contracts. (Stip., ¶¶ 14, 15; R4, tab 11; J. Wilson, tr. 3/168-69) For purposes of assessing the Government-caused changes to established practices, we find that Rohr's quality assurance program was intended to comply with MIL-STD-1520A. We note also that the Government has not taken exception to Rohr's claim and, indeed, has based some of its actions and arguments on alleged departures from MIL-STD-1520A.

The Material Review Board

There is no dispute that given the difficulty of working with the materials, the tight specification tolerances, and the exacting weight requirements, some defects were inevitable. A material review process was available to try to make the parts acceptable through rework or repair since it was not necessary or cost effective to scrap expensive aerospace components that contained defects that could be satisfactorily corrected. This process is recognized in MIL-Q-9858A and in the case of Rohr was implemented through a Material Review Board (MRB), which operated under delegated authority. It is customary in the airframe manufacturing industry for contractors to have and utilize a MRB. Rohr's MRB procedures were an integral part of Rohr's manufacturing process and quality control procedures. (Stip., ¶¶ 20, 21; Dunkel, tr. 4/224-25; Roadick, tr. 4/18-19; Baker, tr. 11/207-08; Thompson, tr. 10/232-37; Carter, tr. 1/138-39)

Under each F-14 contract, NAVPRO provided independent MRB authority to Grumman. Grumman, in turn, granted Rohr the authority to establish and operate an MRB system through Letters of Delegation. Rohr's MRB Board consisted of representatives from the quality, engineering, and manufacturing engineering departments. Grumman approved the members of Rohr's MRB Board in the Letters of Delegation. (Stip., ¶ 18; McNamara, tr. 2/169; Reed, tr. 8/15; exs. A-39, -40, -107, -133)

Defects Experienced in the F-14 Manufacturing Process

Some of the defects experienced in the F-14 manufacturing process included: "voids" in the bonding process (small areas where the bonding agent did not adhere); "short edge margins," where holes were too close to the edge of a component; "positive pressure," where the vacuum seal was broken during the oven curing process; and "gaps" or "steps" when two components were joined together. Some of the defects occurred more frequently than others. For example, one Rohr component, the canted frame, which is part of the nacelle, was subject to weight restrictions. The canted frame was a machined part that began as a 1,500-pound forging and ended as a 237-pound finished part. Each canted frame was different from every other, through hand finishing of the part to remove as much weight as possible. Almost every canted frame was subject to MRB action. (Carter, tr. 1/127-29, 136-37; Dunkel, tr. 4/223-24; ex. A-3, No. 3-20, exs. A-5, at ¶ 6.5, exs. A-39, -40, -107, -133)

The Process of Identifying and Resolving Defects

In compliance with MIL-Q-9858A, and its Letters of Delegation from Grumman, Rohr maintained a system for the identification and disposition of nonconforming material. This system included rework, standard repairs, and the MRB. Under the system a Rohr inspector would record any condition suspected of being a discrepancy on a Form 1575, Inspection Pick-Up sheet. The inspector placed a coded sticker on the hardware at the suspected discrepant area. A quality engineer then examined the part and either agreed or disagreed. If it was not deemed a discrepancy, the part was returned to production.

Minor Rework

If a discrepancy was found, minor rework might be authorized. Minor rework amounted to returning the part to its intended configuration. For example, a rivet that was not installed correctly could be removed and a proper rivet put in its place. Sometimes rework could begin within minutes of the Form 1575 being written. Moreover, on a large assembly, rework could be done on a non-interference basis, so that production could continue on other areas. (J. Wilson, tr. 3/173-75; ex. A-181)

Standard Repairs

If a disposition beyond a simple rework was required, other options existed within Rohr's system. A Standard Repair Manual existed for the F-14 program, which contained pre-approved repairs for common types of discrepancies. These were conditions that had occurred before, were likely to occur again in some random fashion and for which standard fixes had been developed and previously approved by the MRB and the Government. For example, the manual was used to repair common discrepancies encountered in the bonding or mechanical assembly process. DCAS-San Diego had permitted this practice since 1981. A

Form 1576 could be used if an item qualified as a standard repair. A Rohr MRB engineer would determine if a discrepancy could be cured with a standard repair, and if so, which standard repair should be used. Once the repair was made, the item would be reinspected, and then released into production. A standard repair was typically initiated within hours, or a day or two at most, of the identification of a discrepancy. (J. Wilson, tr. 3/175-77, 204; Baker, tr. 11/172-73; exs. A-21, -181)

The "Withhold Tag" Process

If a discrepancy could not be cured by rework or a standard repair, it had to be resolved through the "withhold tag" process, assuming a decision to scrap the part was not made. Rohr would first determine whether the discrepancy constituted a minor or major nonconformance. In general terms, a major nonconformance can be described as a discrepancy that adversely affects the "form, fit [or] function" of the component. More precisely, a major nonconformance is a discrepancy that adversely affects performance, durability, reliability, interchangeability, interface, effective use of operation, weight, appearance, health or safety. A minor nonconformance is anything that is not a major nonconformance. (Reed, tr. 8/17; exs. A-39, -40, -133)

When a withhold tag was written against a part, Rohr placed the part in a secure, fenced-in area known as an MRB "crib." While in the MRB crib, further work could not be performed on the part. If a part was too large to be moved into the MRB crib, it remained in its jig on the production line with a tag applied to it. For tagged parts that remained on the production line, production work would only stop in the area of the part deemed to be discrepant. (J. Wilson, tr. 3/182, 198; exs. A-39, -40, -133)

If the item was a minor nonconformance, a Rohr MRB engineer would determine the type of repair that should be performed. The proposed repair was noted on the withhold tag form. The form was then submitted to DCAS for review. DCAS either accepted or rejected Rohr's proposed action. Rohr had a goal of completing the withhold tag process up to the point of DCAS review within eight hours. (J. Wilson, tr. 3/178-81, 233; ex. A-181)

Grumman Review of Rohr's Quality Actions

A major nonconformance could not be resolved internally within Rohr's MRB system. The withhold tag had to be submitted with a Seller Material Review Request (SMRR) to Grumman and NAVPRO for review and approval. Rohr would first submit the SMRR to Grumman's local representative at Rohr for preliminary review and signature. The SMRR package was then forwarded to Grumman's headquarters for review by its engineering department. Grumman would then submit the SMRR package, together with its recommended action to NAVPRO quality assurance for concurrence. Upon approval the SMRR was returned to Grumman. Grumman would, in turn, send the SMRR to Rohr quality assurance in California. The withhold tag with the approved disposition would then be

returned to the floor at Rohr for repair of the component. (J. Wilson, tr. 3/183-84; ex. A-181)

Every approved withhold tag was intended to result in a hardware repair that was equal to or better than the requirements of the contract. If the MRB process produced a repair that made the part compliant with the specifications, the Government had no objection. (McNamara, tr. 3/131; Guiles, tr. 7/85-87)

Reviews of Rohr's Quality System

Grumman performed annual audits of Rohr's quality compliance during the period 1986-1990. In a process audit dated 1 April 1987, Grumman found that Rohr was in full compliance with all process specifications, such as bonding, plating and painting. There were no negative findings. (McNamara, tr. 2/148-56; J. Wilson, tr. 3/158; exs. A-32, -33, -34, -41)

Grumman performed a quality system audit at Rohr's Riverside and Chula Vista facilities in January 1988, just prior to the transfer to DCAS-Santa Ana. This audit consisted of a review of Rohr's entire quality system. In Grumman's report, dated 15 January 1988, Rohr received an overall rating from Grumman of 86 percent, which was considered satisfactory under Grumman's rating system. (McNamara, tr. 2/156, 163-64; J. Wilson, tr. 3/165; ex. A-35 at 3)

Beginning in 1989 Grumman participated in joint prime contractor (JPC) quality audits at Rohr. The Aerospace Industries Association initiated this effort, with the approval of Government agencies, in order to have a standardized audit performed at suppliers' facilities. Normally, at least seven or eight of Rohr's prime contractors participated in these audits. One week was scheduled for the audit of each of Rohr's facilities in Riverside and Chula Vista. The checklists for each audit followed the requirements of MIL-Q-9858A and MIL-STD-1520. The Defense Logistics Agency (DLA) reviewed the checklists and suggested minor changes, which were adopted. (McNamara, tr. 2/157, 160-62)

In the JPC audit dated 20 January 1989, the Rohr Riverside facilities received a rating of 82.5 percent, which was considered satisfactory under the rating system. In the JPC audit dated 8 June 1990, the Rohr Riverside facilities received a rating of 84.3 percent, which again was in the satisfactory range. (McNamara, tr. 2/164-65; ex. A-36 at 4, ex. A-37 at 4)

DCAS-San Diego Inspection Oversight

DLA Manual (DLAM) 8200.1 is an internal DLA document that provides instructions and procedures for agency representatives. The manual instructs Government inspectors to provide notice of quality deficiencies to contractors by using one of five different types of notice, known as Methods A through E. Method A is an oral notice to the contractor of a

minor deficiency, to which DCAS requests an oral response. Method B is a written notice of a Quality Deficiency Record (QDR) documented on DD Form 1715 in which the contractor is required to submit a written response, including formal cause and corrective action, within a number of days specified on the form. Method C is a notice of serious deficiency in which a letter is sent to company management, requiring a response with formal cause and corrective action from the contractor. Method D is an even more serious deficiency in which the Government asserts that all quality actions will be discontinued until the deficiency is corrected. Method E is a written notice to a prime contractor that a Method C or D notice has been sent to a subcontractor, and it requests the prime contractor to assist in resolving the deficiencies of the subcontractor. (Dunkel, tr. 4/219-22)

DCAS-San Diego was responsible for the Government's quality inspection oversight at Rohr's Chula Vista and Riverside facilities for the first 18 years of the F-14 program. DCAS-San Diego was under the supervision of the DCAS-Los Angeles Regional Office (DCASR-LA). Mr. Russ Dunkel served as DCAS-San Diego's Branch Chief from 1982 through 1988. The F-14 program was one of the Rohr programs under Mr. Dunkel's responsibility. As Branch Chief, Mr. Dunkel was responsible for supervising the performance of the DCAS resident inspectors at Rohr's Riverside and Chula Vista facilities. Mr. Dunkel worked for DCAS-San Diego for 20 years. His prior experience included terms as a resident DCAS inspector at Rohr from 1969 to 1973, and a resident DCAS supervisor at Rohr from 1979 to 1981. (Stip., ¶¶ 17, 22; Dunkel, tr. 4/199-209)

DCAS-San Diego consistently accepted Rohr's hardware, and approved of Rohr's quality assurance procedures. DCAS-San Diego seldom issued QDRs. If a Rohr quality deficiency was identified, DCAS-San Diego normally would discuss it orally with Rohr. When DCAS-San Diego issued a QDR to Rohr, Rohr was given seven manufacturing days (or M days) to provide a written response. Time extensions were granted if reasonably necessary to provide a full response. (Simpson, tr. 6/222-23; Dunkel, tr. 4/230; Baker, tr. 11/167-68)

The DCAS-San Diego Branch Chief, Mr. Dunkel, considered the MRB activity at Rohr comparable to the activity at other aerospace facilities in which he had worked as an inspector. He testified that there were never any findings of excessive MRB activity at Rohr, and Rohr's MRB authority had never been withdrawn for any reason. (Dunkel, tr. 4/222-25) Grumman considered the level of MRB activity at Rohr comparable to its own experience on the F-14 program and that of other airframe manufacturers. Moreover, there were very few major nonconformances elevated for review by Grumman and NAVPRO. (McNamara, tr. 3/70-71, 135; J. Wilson, tr. 3/201; Reed, tr. 8/14; Baker, tr. 11/166-68)

From Mr. Dunkel's perspective, as of January 1988, there were no significant quality assurance problems at Rohr, and no reason to alter significantly Rohr's quality assurance practices or procedures. (Dunkel, tr. 4/231)

The Transition from DCAS-San Diego to DCAS-Santa Ana Inspection Oversight

In August 1987, the Section Chiefs of DCAS-San Diego and DCAS-Santa Ana, in conjunction with the Director of Quality for DCASR-LA, began considering the transfer of inspection cognizance for Rohr's Riverside facility to DCAS-Santa Ana. The parties have stipulated that the proposed transfer of inspection cognizance to DCAS-Santa Ana had nothing to do with any perceived quality assurance deficiencies at Rohr's Riverside facility. Instead, the decision to transfer inspection cognizance of Rohr's Riverside facility to DCAS-Santa Ana was based on the logistics of trying to monitor a plant two hours away from the DCAS-San Diego office. (Stip., ¶¶ 23 through 25; ex. A-43)

On 19 August 1987, Mr. John Hogencamp, Section Chief of the DCAS-Santa Ana office, made a fact finding visit to review the DCAS function at the Rohr Riverside facility. In an interoffice memorandum to the Director of Quality of DCASR-LA, Mr. Hogencamp stated that, in his view, the DCAS "[f]acility is considerably understaffed and improperly structured." Mr. Hogencamp stated that "[t]his facility is in dire need of a talented and aggressive SQAS [Supervisory Quality Assurance Specialist]." Five GS-9 positions were authorized. There was one vacancy, with a temporarily promoted GS-11 serving as the SQAS. At the time, four additional individuals were detailed to help with the work load. He felt "a GS-1910-12, SQAS, two GS-1910-11, SQAS product line supervisors and 9 or 10 GS-1910-09 QASs" were needed. Among the other problems he noted were that "MRB actions are allowed to by-pass DCAS on weekends, nights or other times when DCAS is not present." (Ex. A-44; Rumell, tr. 6/29)

On or about 5 October 1987, DCAS-Santa Ana loaned Mr. Robert Rumell to DCAS-San Diego to work as a temporary SQAS at Rohr Riverside, with the view of preparing for the transfer of Rohr's Riverside facility from DCAS-San Diego to DCAS-Santa Ana cognizance. The plan at the time was to transfer the quality assurance function to DCAS-Santa Ana on 1 November 1987. The transfer to DCAS-Santa Ana did not occur until 24 January 1998 and Mr. Rumell reported to Mr. Dunkel of DCAS-San Diego until that time. (Stip., ¶¶ 27, 28, 30; R4, tab 58; Rumell, tr. 5/194)

Prior to being assigned at Rohr, Mr. Rumell had been a DCAS inspector at what was regarded a problem facility. Mr. Rumell testified that when he went to Rohr Riverside in October 1987, he had heard that Rohr was also a problem facility. (Tr. 5/201-02, 215) Mr. Rumell had never been assigned to an airframe manufacturer's facility. He had worked as a DCAS inspector primarily at electronics facilities. DLA issues certifications to its inspectors to signify familiarity with various trades, commodities or industries. Mr. Rumell possessed mechanical, electronics and software certifications from DLA. However, during the time he worked at Rohr, he did not possess aircraft or aerospace certifications. (Rumell, tr. 5/197-203, 205-08)

He acknowledged that there were a "bunch of things" he and Mr. Dunkel did not agree on. He testified that in his opinion the level of MRB activity was "[w]ay, way, way too high," and that "[p]robably in some cases, you might say about 50 to 100 percent, 200 percent too high." He also testified that, in his experience, "probably 99 percent of the companies in the country . . . make product that can be shipped without MRB. . . . They make the product right the first time." His observations were based on his experience at electronics facilities. (Tr. 6/30-31, 106)

Rohr's Director of Quality at Riverside from January 1988 to March 1989, Mr. Jim Hall, dealt with Mr. Rumell almost daily. He testified that Mr. Rumell indicated to him that Rohr should be able to build product without any MRB and believed that DCAS-San Diego's practices needed a major overhaul. He believed Mr. Rumell had a good inspection background insofar as inspection techniques, but lacked aerospace expertise, particularly in the adhesive bonding area. He testified that "MRB activity basically came to a standstill after his arrival." (Hall, tr. 5/71-74)

On at least four occasions, Mr. Rumell stated to Rohr and Grumman personnel that, after DCAS-Santa Ana took over, he was going to shut Rohr down. Mr. Rumell told Mr. John McNamara of Grumman that if Rohr could not get its MRB activity to an acceptable level, he would target Rohr to "shut it down." Mr. McNamara was Grumman's Assistant Quality Manager with surveillance responsibilities over Rohr's F-14 program. Grumman's resident staff at Rohr reported to him. (McNamara, tr. 2/129-33, 145-46) Mr. Rumell made similar statements to Mr. Jim Wilson, Mr. Jim Hall, and Mr. Richard Hammond of Rohr (J. Wilson, tr. 3/212-13, 242-43; Hall, tr. 5/76, 116; Hammond, tr. 14/51).

Mr. Rumell had strong disagreements with Mr. Dunkel about the methods of performing DCAS inspection oversight at the Rohr Riverside facility and Mr. Dunkel, in turn, questioned Mr. Rumell's competency. One of the disagreements occurred on 24 November 1987, when Mr. Rumell refused to process a Rohr withhold tag concerning an oversized hole. Mr. Dunkel traveled from San Diego to Riverside to assess the problem. Mr. Dunkel observed an oversized rivet hole in which Rohr had recommended redrilling the hole and installing an appropriate fastener. Mr. Dunkel advised Mr. Rumell that if he did not want to sign the withhold tag, Mr. Dunkel would assume responsibility for it. Mr. Rumell said that signing withhold tags was his responsibility, and he would sign it. Mr. Dunkel returned to San Diego, only to be informed by Rohr that Mr. Rumell now was holding up five more withhold tags. Mr. Dunkel again contacted Mr. Rumell and informed him that if Mr. Rumell was not technically competent to perform his function, he would have to be replaced at Rohr. (Dunkel, tr. 4/235-36)

Mr. Rumell recorded his version of this incident in a handwritten conversation record, dated 25 November 1987, which stated as follows:

> Dunkel called from San Diego after he had visited, he left about noon, and stated that if I didn't do what he wanted, he would replace me. (11/24/87)
>
> He manages by interfacing with contractor usurping SQAR's authority. I stated I didn't agree with his way of managing.
>
> Basic problem is MRB. His way is kick & ship as I blame him for the mess here at Rohr. "No Control." I think he's in bed with contractor.
>
> I notified Hogencamp of situation. 11/25/87; 0800.
> We are signing off MRB tags on A/C [Aircraft] side with unsatisfactory C/A [Corrective Action] and repetitive anomalies by Dunkel's direction.

(Ex. A-49)

The term "kick and ship" used by Mr. Rumell is a derogatory reference to the way in which he observed Mr. Dunkel performing hardware inspections. Mr. Dunkel, when shown a copy of Mr. Rumell's handwritten record, disagreed that there was any "mess" at Rohr, or that there was any problem with Rohr's MRB. Mr. Dunkel testified that he found Mr. Rumell to be technically incompetent, that he failed to follow direction, and that his personality was very abrasive and arrogant. According to Mr. Dunkel, Mr. Rumell had difficulty communicating his fundamental problems to the contractor. In hindsight, Mr. Dunkel believes he should have removed Mr. Rumell from Rohr. (Rumell, tr. 6/28-29; Dunkel, tr. 4/234, 239-40)

Mr. Rumell acknowledged that he had many disagreements with Mr. Dunkel about how quality assurance should be performed at Rohr Riverside. He thought that a different approach to quality inspection oversight should be used at Rohr, and that after DCAS-Santa Ana took over, the situation at Rohr would "improve." Mr. Rumell thought it would be easier to make the changes that he believed were necessary. (Rumell, tr. 6/16-19, 24, 84)

DCAS-Santa Ana's Assumption of Inspection Responsibilities At Rohr Riverside

On 24 January 1988, DCAS-Santa Ana formally took over inspection responsibilities at Rohr's Riverside facility (ex. A-59; stip. ¶ 30). This also included responsibility for the Moreno Valley facility (ex. A-190).

DCAS-Santa Ana's management questioned the inspection approach taken by DCAS-San Diego. The differences between the two DCAS offices, as observed by

DCAS-Santa Ana, were highlighted in a handwritten memorandum prepared by Mr. John Hogencamp, the DCAS-Santa Ana Section Chief. Under the heading "History (Prior to Santa Ana Take-over)," Mr. Hogencamp stated:

> Facility transferred to DCASMA Santa Ana January 1988 with pre-existing condition as follows:
> - CQAP [Contractor Quality Assurance Program] files outdated and in disarray
> - Unknown (active) contract count/dollar value
> - Undetermined contractual requirements
> - Non-specific delegations (had not been challenged)
> - Current CQAP records virtually non-existant [sic], except for PVI which was limited to "general" type characteristics
> - No permanent QAR assigned
> - Lack of qualified personnel (two individuals had been on board approximately 10 months without any CQAP training whatsoever)
> - 7 day around the clock coverage on Titan program (two people per shift regardless of workload)
> - No evidence of PR [Procedures Review] having been performed. . . .
> - Unable to ascertain current PE [Procedures Evaluation] status/apparantly [sic] was not being performed.
> - MRB inherent in all of Rohr's production/dispositions rarely challenged.
> - On board personnel complaining of a lack of support from the Branch Chief, ie:
>   - — directed subordinate personnel to ship non-conforming hardware from time to time.
>   - — Would not listen to problems - always favored contractor

(Ex. A-278)

From 19-21 January 1988, representatives from DCAS-Santa Ana and DCASR-LA visited Rohr Riverside to perform a workload evaluation. The official findings from the workload evaluation included the following comments:

> a. Prior to Sep 1987, there were only 11 QDRs written; however, after [Mr. Rumell] arrived 43 QDRs were issued. The reason given for the low number of QDRs issued during the early part of the year was due to the policy set by [Mr. Dunkel], [Mr. Rumell] decided not to follow this contradictory policy.

> b. [Mr. Rumell] also elected not to follow [Mr. Dunkel's] policy in the area of MRB. [Mr. Rumell] would not sign off on a specific MRB action, Rohr contacted [Mr. Dunkel], who drove to Riverside to sign off on the MRB. [Mr. Dunkel] then directed [Mr. Rumell] to buy off on MRB actions or [Mr. Rumell] would be replaced or gotten rid of (This information was provided by [Mr. Rumell]).
>
> c. There are also a higher number of MRB actions at this facility, approximately 450 per month. The QASs on the Aircraft side have had little or no training in the area of MRB activities. This is evidenced by the nature of C/A's [Corrective Actions] being accepted and also the methods in which MRB is performed i.e., not looking at the parts.

(Ex. A-57 at 2; Dunkel, tr. 5/5-12; Rumell, tr. 6/80-88)

Mr. Danny Simpson, a DCAS inspector, confirmed the difference in viewpoint. Mr. Simpson worked at Rohr Riverside under both DCAS-San Diego and DCAS-Santa Ana and had significant involvement in the latter's inspection efforts. He described Mr. Rumell as a "book man" who enforced all contract requirements and knew the applicable military specifications from cover to cover. In contrast, he viewed Mr. Dunkel as far more lenient in his enforcement of contract requirements. Mr. Dunkel sharply disputed Mr. Hogencamp's characterization of his actions. (Simpson, tr. 6/179-83, 197-205; Dunkel, tr. 5/27-28) Based on our review of the record, there is no reason to conclude that Mr. Dunkel discharged his official responsibilities in anything other than a professional manner based on his understanding of the inspection practices in effect during his tenure.

The Government's Quality Systems Review Audit

From 22 February 1988 through 14 March 1988, DCASR-LA performed a Quality Systems Review (QSR) audit of Rohr's Riverside and Chula Vista facilities. (Stip., ¶ 32) The audit was conducted at Mr. Rumell's suggestion. The QSR audit resulted in various findings critical of the quality systems at Rohr's Riverside and Chula Vista facilities. (Ex. A-98) Mr. Rumell signed the findings concerning Rohr's Riverside facility on behalf of the Government. He testified that because of a scheduled briefing, he was directed to sign them. He did not read them or analyze whether the findings were valid. (Tr. 6/131-33)

The QSR audit also included a review of the performance of the DCAS resident inspectors at Rohr's Riverside and Chula Vista facilities. Though critical of some of Rohr's actions, the report was focused on the performance of the Government's inspectors. Mr. Scott Blank of DCASR-LA, who participated in the audit, prepared an analysis (hand

written) that was critical of the DCAS resident inspectors' performance, both from the perspective of being too lenient on the one hand and not understanding the MRB process on the other. (Ex. A-87) The report stated, in part, that:

> The contractor is averaging over 400 MRB actions per month. A review of over 200 MRB actions was made by this review team. From this review it is very apparent that [Mr. Rumell] and [the] QASs at Rohr Riverside lack the proper understanding of MRB, i.e., purpose of what is an acceptable CA [Corrective Action] by the contractor, what is an acceptable MRB system. . . .
>
> . . . .
>
> [Mr. Rumell] did attempt to withdraw MRB privileges via QDR #88-14. MRB privileges were withdrawn as of 26 Jan. 88. The privileges were reinstated as of 27 Jan. 88. The following are common of the actions taken by [Mr. Rumell] in his efforts to insure the contractor has an effective MRB system in place.
>
> a. QDR 88-14 is one of the most hideous QDRs this team has ever seen. The QDR withdraws MRB privileges, because Rohr's QADIs para. 5.2.1 did not meet the requirement of MIL-Q-9858A para. 6.5. The QDR did not state any specifics.

(Ex. A-87)

By letter of 22 March 1988, Mr. George Thompson, Director of Quality Assurance, DCASR-LA, observed that based on the QSR "the health of the CQAP [Contractor Quality Assurance Program] at both facilities was deemed significantly unsatisfactory." The letter asked the section chiefs at DCAS-San Diego and DCAS-Santa Ana to show cause why the certifications of all DCAS resident inspectors at Rohr's Riverside and Chula Vista facilities should not be revoked, "[s]ince all QASs assigned to both facilities have failed in their responsibility to establish and maintain an acceptable CQA [Contractor Quality Assurance] Program." The section chiefs were given 30 days to determine whether these individuals' unacceptable performance arose from "causes beyond their control and without fault on their part." Finally, the section chiefs were told to take the deficiencies into consideration when doing the individuals' annual performance appraisals during the month of April. (R4, tab 90)

On 25 March 1988, Mr. Rumell left Rohr Riverside for a reassignment. Mr. Rumell made it clear to his superiors that he believed he had done exactly what he had been directed to do. He was succeeded as SQAS at Rohr Riverside by Mr. Scott Blank. No certifications

were revoked. (Ex. A-53; Rumell, tr. 6/62, 143-46) Though Mr. Dunkel and Mr. Rumell clashed over inspection practices, and may ultimately have developed a personal animosity, the record is clear that the friction stemmed from DCAS-Santa Ana's interest in changing inspection practices in effect at Rohr.

Representative Changes in Prior Practice Caused by DCAS-Santa Ana

At trial and in its submissions Rohr has identified 16 categories of alleged changes in inspection practices at Rohr's Riverside facilities during the claim period caused by DCAS-Santa Ana: Rescission of Rohr's Standard Repair Manual; Change in the Definition of Major and Minor Nonconformances; Elevation of Withhold Tags to Grumman and NAVPRO as Major Nonconformances; Change in the Definition of Repetitive Discrepancy; Withdrawal from Participation in Rohr's MRB Board; Arbitrary Removal of Members from Rohr's MRB Board; Refusal to Service Rohr's MRB Cribs on a Timely Basis; Refusal to Allow Shipment of Parts While Corrective Action Pending; Lack of Experience or Ability to Review and Disposition Withhold Tags; Issuance of Increased Number of QDRs; Revocation of Rohr's P-Note System; Change in Method of Inspection from Product Verification Inspection (PVI) to Product Oriented Procedures Evaluation (POPE); Changes to Rohr's Planning Documentation Through Demands for Additional "Objective Evidence" of Specification Compliance; Performance of Unreasonable and Inconsistent Inspection of Planning Documentation; Imposition of Unreasonable Criteria for Paint Primer Inspection; and Failure to Support Rohr Through Weekend and Overtime Coverage.

The actions complained of occur at various points throughout the claim period. We have rearranged the 16 categories in rough chronological order in our fact findings in order to underscore the sweep and systematic character of DCAS-Santa Ana's actions. We deal with each category in turn.

1. Change in Method of Inspection from PVI to POPE

DCAS-San Diego employed the PVI method on the F-14 manufacturing line at Riverside. The PVI method of inspection tended to be product oriented. The method placed an emphasis on review of the hardware, rather than the paperwork. The item itself was inspected for conformity and then the supporting data was examined for accuracy. The individuals performing PVI determined how they desired to weight their inspection between examination of the hardware and examination of the supporting data. Hold points were established throughout the contractor's facility where the item was held, and DCAS was notified that the item was available for inspection. DCAS then performed the physical inspection on the floor at the hold point. (Samuelson, tr. 21/13-15; Simpson, tr. 7/41-42; Guiles, tr. 7/126)

The PVI procedure involved mandatory inspection points for critical areas, such as important dimensions, or areas which would be covered up or not be accessible after the

component reached final inspection. Final inspection of the hardware occurred while the part was in the final tool (holding the hardware) and before shipping. Inspection of the paperwork involved a verification of the final shipping book for completeness and a certification of compliance with the engineering configuration. (J. Wilson, tr. 3/156-57)

On 5 January 1988, Mr. Rumell notified Rohr that DCAS would be using the POPE method of inspection. (Rumell, tr. 6/51-53; ex. A-52) The POPE method of inspection leaned more toward an examination of the controlling factors of production processes and then an inspection of some of the product to see that controls were in place. (Samuelson, tr. 21/13-15) Thus, the emphasis of POPE was to inspect Rohr's processes and paperwork, rather than the hardware.

Effective 25 May 1988, Rohr was no longer required to inform DCAS-Santa Ana of any in-process hardware inspections. POPE became DCAS-Santa Ana's primary method of inspection until July 1990. (Roadick, tr. 4/54-55, 119-21; exs. A-119, -121) The mandatory in-process hardware inspection points were removed, with the exception of inspection of the hardware in the final tool. Rohr was not allowed to remove a component from the final tool until DCAS performed its inspection. (Rumell, tr. 6/45, 51-53; ex. A-52; Lounsbury, tr. 9/21-22)

There was testimony from Mr. Ed Samuelson, the DCAS product line specialist for military aircraft, that at the end of September 1988, DCAS reevaluated how well POPE met the conditions at Rohr Riverside and then made further revisions. Mr. Samuelson was assigned to Rohr Riverside in early September and remained until April 1992. He and others, who reported to him, were primarily responsible for F-14 inspections. (Samuelson, tr. 20/206, 212-14)

The method used by DCAS after September 1988 relied on the data in Rohr's ASOs to determine conformity with the specifications. DCAS reviewed the ASOs to determine acceptability and then performed a final visual inspection of the hardware. There were no in-process inspections or hold points. The DCAS inspectors did not perform any inspections as the material moved through the various cost centers. DCAS was now performing an end of line inspection and verifying the quality based on the paperwork in the ASOs. Mr. Samuelson testified that one of the reasons for the further change was the view that DCAS could better use its limited resources in this way. (Samuelson, tr. 21/13-15, 52-54; Simpson, tr. 7/40-42) We note in this regard that the further modification to the POPE system in September placed even greater emphasis on a paper work review. To refer to the change, as the Government has suggested, as a modified PVI system is in error.

DCAS-Santa Ana stopped using POPE when the July 1990 Operating Guidelines began. (Roadick, tr. 4/119) The guidelines required DCAS-Santa Ana to review Rohr's ASOs on a post-audit basis, and to review bonding and other production processes using different

methods that whenever possible would be conducted on a non-interference basis with Rohr's production or shipment of hardware. (Ex. A-317, R6066746-R6066748, 2(b) and 2(c))

Mr. Rumell testified that he personally believed PVI was a better method than POPE for inspecting Rohr's F-14 components. (Rumell, tr. 6/77) In his fact finding review of the F-14 claim, LCDR Corning admitted that DCAS-Santa Ana's use of POPE constituted a change in practice. LCDR Corning found that POPE involved a more rigorous final inspection of the hardware and a greater emphasis on Rohr's quality assurance documentation. (Corning, tr. 9/196, 10/11; ex. A-343, at 38; ex. A-390) Mr. Simpson also acknowledged that the change to POPE resulted in an increased number of QDRs issued to Rohr. (Simpson, tr. 6/192)

Our own independent review leads us to the same conclusion the contracting officer reached.

2. Revocation of Rohr's P-Note System

Beginning in the early 1980s, in coordination with Grumman and DCAS-San Diego, Rohr implemented a procedure for incorporating engineering changes into its production process prior to Grumman's formal change to the drawings. This procedure was known as the Production Note System, or more commonly the "P-Note" system. It was designed to deal with a situation where an engineering drawing was the basis for a nonconformance. The P-Note system was necessary because, in manufacturing the F-14 components in accordance with the Grumman drawings, Rohr found circumstances where, for example, drawings were inconsistent and resulted in the manufacture of conforming parts that could not be assembled together. The note was written by Rohr engineering and explained how to rework the hardware to produce an acceptable product. Grumman engineering approved each P-Note. Rohr provided a formal engineering change request to Grumman for each P-Note; however, Grumman's system required up to six months to change the drawings. In the meantime, the P-Note remained in effect.

The P-Note system allowed Rohr to rework a part on the manufacturing line through the P-Note engineering change directly on the drawing. Without the P-Note system, Rohr had to process each part affected by the engineering change through the MRB process, while Rohr's request to Grumman for an engineering change was being processed. (McNamara, tr. 2/176-80; Reed, tr. 8/100, 101; D. Wilson, tr. 15/7-10; J. Wilson, tr. 3/205-07; ex. A-23)

Rohr's F-14 Senior Contract Administrator, Mr. David Wilson, testified that in the January-February 1988 time frame, Mr. Rumell questioned the operation of the P-Note system. Shortly thereafter, when Rohr was unable to explain the P-Note system in a manner that was acceptable to Mr. Rumell, Rohr was told to cancel the policy and procedure for P-Notes. (D. Wilson, tr. 15/6, 13; J. Johnson, 1/28-29; exs. A-127, -128) Mr. Wilson's testimony was not contradicted and we find it persuasive. We conclude that the P-Note

system was canceled in the February 1988 time frame and not in October 1987 as was indicated in Rohr's claim (R4, tabs 6, 62; tr. 3/84, 229-31).

Revocation of the P-Note system increased the level of Rohr's MRB activity. Under DCAS-San Diego, Rohr typically had between 50 and 100 P-Notes in use at any given time waiting for formal engineering change orders from Grumman. At the time Mr. Rumell revoked the use of the P-Note system, Rohr had 51 P-Notes in use. At Rohr's request, Grumman developed a plan to clear the outstanding P-Notes. Rohr also had to track and prioritize the formal engineering change orders through the Grumman approval process. In the meantime, Rohr experienced inefficiency and delay because it was required to process each part affected by a P-Note through its MRB system. After the revocation, Rohr could still write a P-Note and have it formally approved by Grumman, but could not use the P-Note as an advance system. (D. Wilson, tr. 15/12-19; exs. A-127, -128) Without a P-Note system, the level of Rohr's MRB activity immediately increased because each part being built to the informally released engineering had to be processed on a withhold tag through the MRB system.

3. Refusal to Service Rohr's MRB Cribs on a Timely Basis

The evidence shows that DCAS-San Diego typically serviced Rohr's MRB cribs twice per day and provided on-call service for withhold tags that needed immediate review to ensure that no backlog existed which might stop Rohr's assembly line. DCAS-San Diego also allowed Rohr to work at its own risk on second shifts or weekends if critical "line stop" withhold tags were encountered, deferring DCAS review until the next normal work day. (Hall, tr. 5/68; Wilson, tr. 3/98-99; Baker, 11/160-65)

Shortly after Mr. Rumell arrived at Rohr Riverside on 5 October 1987, he stopped servicing Rohr's MRB cribs more than once or twice per week. (Hall, tr. 5/82-83, 98-99; Rumell, 6/113-16; exs. A-69, -99; Gov't br. at 16-17) Rohr asked John Hogencamp, Mr. Rumell's supervisor, for additional employee coverage for withhold tag review. However, Mr. Hogencamp made no changes to Mr. Rummell's policy, stating to Mr. Hall, "What's the matter; can't you guys build any conforming hardware?" (Hall, tr. 5/81-83; ex. A-99) A study of a three-week period in March 1988 conducted by Mr. Jim Hall, Rohr's Director of Quality from January 1988 until March 1989, showed that only 11 percent of Rohr's requests for DCAS-Santa Ana to service the MRB cribs were responded to within four hours. DCAS-Santa Ana's response times for MRB tag review varied from 7 to 140 hours. (Hall, tr. 5/69-70, 76-80; ex. A-103)

A backlog of unreviewed MRB withhold tags existed throughout Mr. Rumell's tenure at Rohr Riverside, which ended on 25 March 1988 (Hall, tr. 5/83-86, 101; Rumell, tr. 5/196; Baker, tr. 11/236; exs. A-69, -100, 102). Rohr has acknowledged, however, that after Mr. Rumell's departure, DCAS reviewed Rohr's withhold tags on a more regular basis (app. br. at 200).

Rohr and the Government have identified Mr. Danny Simpson as the principal DCAS-Santa Ana quality assurance representative responsible for reviewing tags at the Rohr MRB area during the mid-to-late 1988 through 1990 time period. Mr. Simpson had previously performed inspection work on Rohr's military aircraft programs (including the F-14) from May 1986 until late 1986 or early 1987 when he began to work primarily on Rohr's Titan missile program. He felt that DCAS was understaffed at the time. He returned to military programs in 1988. (Simpson, tr. 6/172-77, 6/189-94; Samuelson. tr. 21/28)

The time Mr. Simpson spent reviewing withhold tags depended on the amount of work available at the Rohr MRB cribs. Mr. Simpson would typically service the MRB cribs on a daily basis and worked at the MRB cribs for as long as required, even all day, to complete the work within normal hours. (Simpson, tr. 7/45; Samuelson, tr. 21/28-29) No Rohr employee ever expressed any concerns to Mr. Samuelson, Mr. Simpson's supervisor, about any failure on Mr. Simpson's part to perform MRB work (Samuelson, tr. 21/87). Moreover, Mr. Hall testified that Mr. Simpson supported the MRB very well, made timely sign off decisions on tags, and by his MRB recommendations and disposition decisions demonstrated his knowledge of aircraft structure (Hall, tr. 5/106).

The Government argues that Mr. Rumell's actions resulted in a *de minimis* impact on Rohr because Rohr did not ask Mr. Dunkel to overrule Mr. Rumell's practice. For the period after Mr. Rumell's departure, it says that Rohr has made no credible case that DCAS-Santa Ana provided less frequent service to the MRB crib than DCAS-San Diego. The Government argues that if Rohr did not complain to Mr. Simpson or Mr. Samuelson, DCAS-Santa Ana must have serviced Rohr's MRB cribs adequately.

We find that DCAS-Santa Ana's actions constituted a change from the established practices under DCAS-San Diego, particularly during Mr. Rumell's tenure. However, once he departed, we cannot conclude that the DCAS-Santa Ana response was less frequent than DCAS-San Diego during normal working hours. Nevertheless, as discussed *infra*, there was less willingness to support overtime coverage. The Government may be correct in saying that standing alone the impact is *de minimis*. However, it is a further example of the change in DCAS's attitude toward how it would perform quality assurance at Rohr. And, we consider the impact of this change in the context of the other changes made by DCAS.

4. Failure to Support Rohr Through Weekend and Overtime Coverage

DCAS-San Diego did not typically provide second shift or weekend coverage to perform inspections or review MRB tags for the F-14 program. DCAS-San Diego was authorized, however, to work overtime and weekends on the Titan missile program at Riverside, and to support MRB for the F-14 program when time permitted. If no DCAS-San Diego inspector was available, DCAS-San Diego and Rohr agreed that Rohr could proceed at its own risk with MRB repairs. A Rohr quality representative was authorized to indicate on

the withhold tag that DCAS was unavailable. This allowed Rohr to continue working on the hardware at its own risk until the next work day when a DCAS inspector was available to review the disposition. The withhold tags Rohr worked on at its own risk were to be presented for review of the repair by a DCAS representative at the start of the shift on the next work day when a DCAS inspector was available. (R4, tab 265 at 8; Hall, tr. 5/91-92, 114-15; Baker, tr. 11/163-65)

Under DCAS-Santa Ana, Rohr could still release withhold tags without DCAS signature. Repairs made by Rohr were not to be covered until after DCAS had an opportunity to examine the repair. However, Rohr's ability to proceed at its own risk with MRB repairs on second shifts and weekends was revoked several times by DCAS because Rohr failed to comply with its agreement with DCAS that the repairs would be presented to DCAS at the start of the next shift. (R4, tabs 155, 265 at 8)

Under DCAS-San Diego, Rohr was also permitted to simply call the DCAS office and the inspection request would be logged in. In contrast to the practice under DCAS-San Diego, in February and March 1988, Mr. Rumell instituted a call sheet system for Rohr to submit written requests for inspections, including DCAS coverage for weekends and second shift. The call sheet system is a standard planning tool in facilities with DCAS inspectors. Rohr was required to provide the part number, purchase order number, type of inspection, the time a DCAS inspector was needed, and a schedule so that DCAS could determine if support would be provided. Requests for production inspection had priority over MRB items. (J. Wilson, tr. 3/225-26; Hall, tr. 5/80; Samuelson, tr. 20/231; exs. A-69, -91)

On 4 February 1988 and again on 26 February 1988, Mr. Rumell informed Rohr that DCAS-Santa Ana inspectors providing weekend support for the Titan program would no longer be allowed to provide either MRB or inspection support to the aircraft programs in the absence of special justification. Rohr was required to submit written requests with justification to DCAS-Santa Ana for weekend coverage on the aircraft programs by noon on the day before the coverage was needed. If it was beneficial to the Government, some coverage might be provided. On 1 March 1988, Mr. Rumell informed Rohr that DCAS-Santa Ana would no longer provide second shift inspection coverage (Hall, tr. 5/91-92, 100-01; exs. A-69, -88).

On 4 March 1988, Mr. Rumell informed Rohr that DCAS-Santa Ana had not included any overtime inspection coverage in its budget. In addition, Mr. Rumell required Rohr's written requests for final inspection coverage to include the part number, purchase order number, type of inspection, the time that Rohr needed the DCAS inspector, and a copy of Rohr's delivery schedule. Mr. Rumell stated that no overtime coverage would be provided for review of MRB tags or for parts that were behind schedule. (Hall, tr. 5/104-05; ex. A-91)

The DCAS personnel at Rohr's facilities did not have the authority to approve overtime. Overtime was authorized by upper management at the DCAS-Santa Ana office.

When Rohr requested overtime coverage, DCAS personnel at the Rohr Riverside facility would determine whether an inspector was available to work and notify the DCAS-Santa Ana section chief. DCAS-Santa Ana management required verification by the procuring contracting officer that there was a priority need for the particular material. The overtime request would then be approved or disapproved by management in the DCAS-Santa Ana office. The Rohr Riverside DCAS office was required to keep records of the time and the work performed on weekends and submit this information to their supervisors in the DCAS-Santa Ana office. (Samuelson, tr. 21/34-35, 73-76; R4, tab 104; exs. A-207, -208)

As early as May 1989, it was DCAS policy to provide support for Rohr's overtime effort only after receipt of a letter from the procuring contract activity identifying those products by part number and serial number which were considered mission essential. It was also the position of the DCAS-Santa Ana quality division chief that the contracting officer's request be examined carefully:

> Thanks for the heads[-]up on the F14 request for second shift and weekend coverage. I would like detailed records of the work presented by the contractor to validate the workload of the QAR during these periods. If this request at the urgence of the contractor is a waste of time I want to go back to the PCO with the statistics to request the contractor to reimburse us for spending money with no benefit to the Government. I also want a hard line taken relative to repeat MRB and an absolute demand that the contractor implement a corrective action system [in accordance with] 1520 or other conforming material control system contracted for. No more slack to Rohr. I'll support the QAR, any problems we need to get personally involved.

(Samuelson, tr. 21/75-77; ex. A-208)

During this time frame, DCAS-Santa Ana began requiring Rohr to submit more detailed written requests for overtime inspection. DCAS would review nothing that was not on the list. This approach made it more difficult for Rohr to predict on a Thursday the hardware that would be ready for inspection during the weekend. For example, under the prior method, if Rohr was working on three weekly doors, it could request weekend coverage for one weekly door, knowing that one of the three would be ready for inspection by the weekend. Under the new approach, Rohr had to identify which of the three weekly doors would need inspection, leaving it no alternative if something unexpected prevented that specific weekly door from being ready. During this period, DCAS-Santa Ana also began providing its inspectors with compensatory time for overtime work rather than overtime pay, making it less desirable for inspectors to volunteer for overtime. (J. Perez, tr. 9/104-05; Hammond, tr. 14/39-44; ex. A-225)

DCAS-Santa Ana provided some overtime coverage throughout the claim period, although not to the extent that Rohr requested. Rohr had hardware that was available for inspection almost every weekend because of its efforts to meet its production schedules. Rohr's evidence shows that in early 1989, for a two month period, Rohr was able to get Saturday overtime coverage 50 percent of the time. Sunday coverage was rare. Later, when the DCAS-Santa Ana compensatory time policy was in effect, it became harder to get overtime coverage and coverage was seldom provided. Moreover, parts that were presented for inspection were often rejected by DCAS. (Hammond, tr. 14/38-39, 42-49) There were also occasions during the claim period when Rohr requested overtime coverage at the Rohr Riverside facility, DCAS-Santa Ana approved the request, but no material was presented for DCAS inspection during the scheduled overtime hours. (Samuelson, tr. 21/33-34; R4, tabs 263, 287)

The initial system in place for prioritizing inspection requests at Rohr Riverside was the first-in, first-out method. In November of 1989, in order to deal with the backlog, DCAS-Santa Ana agreed, at Rohr's request, to a system that called for Rohr to prioritize the parts that were to be inspected over the weekend, and on weekdays as well, into three categories. The system did not prove effective in addressing the problem. If the first priority was not ready when DCAS came to inspect the part, DCAS-Santa Ana dropped the part to the bottom of the priority list and it had to be resubmitted. There is also evidence that Rohr changed the priority it assigned to parts, resulting in a backlog of lower priority parts. (Hammond, tr. 14/46-50; Samuelson, tr. 20/231-33)

Both DCAS-San Diego and DCAS-Santa Ana had similar resource constraints and the evidence of comparative levels of support is inconclusive. However, DCAS-Santa Ana did change the established prior practice for obtaining overtime support by formalizing and then further refining the informal practice of dealing with overtime requests. Specific impacts of this change have not been identified. The impact must be seen in the context of the systematic changes made by DCAS-Santa Ana.

5. Lack of Experience or Ability to Review and Disposition Withhold Tags

The DCAS-Santa Ana inspectors initially lacked experience in airframe manufacturing. Mr. Rumell, who was responsible for the DCAS office from October 1987 to March 1988, had an electronics background. Mr. Dunkel went so far as to testify that Mr. Rumell's electronics background and lack of experience at an airframe manufacturing facility left him "technically incompetent" to review Rohr's MRB dispositions. (Dunkel, tr. 4/234-36, 239)

Mr. Guiles, who supervised the DCAS office from August 1988 to November 1990, did not possess aerospace or aircraft certifications prior to his arrival at Rohr. He later obtained a certification. Mr. Guiles further testified that Rohr Riverside was the only aircraft manufacturing facility at which he had ever worked, and the only time in which he was a

resident supervisor of a DCAS inspection staff. (Guiles, tr. 7/53-55) During his tenure Mr. Guiles could not recall any inspectors who had been assigned to an aerospace manufacturer's facility prior to coming to Rohr. (Guiles, tr. 7/162-63; Luksza, tr. 10/165) Mr. Danny Simpson testified that prior to becoming a DCAS inspector at Riverside, the only DCAS trade certifications that he possessed were in electronics. However, Mr. Simpson had initially been assigned to Rohr in 1986 and was recognized to have significant experience and was qualified to do MRB work. (Simpson, tr. 6/174; Dunkel, tr. 5/40; Hall, tr. 5/106; Luksza, tr. 10/186-88) Mr. Ed Samuelson was assigned to Rohr in September 1988 and remained at Rohr until April 1992. He possessed a mechanical certification and an aerospace certification, which he received in 1984. (Samuelson, tr. 20/199, 206)

Rohr argues the lack of experience of the DCAS-Santa Ana inspectors resulted in indecision and delay in their review of Rohr's withhold tags. (Blank, tr. 13/68-69; ex. A-438 at 83-85) In particular, DCAS-Santa Ana's inability to distinguish between major and minor process discrepancies caused all process discrepancies to be elevated to major nonconformances. (Hammond, tr. 13/154) According to Mr. McNamara, Mr. Rumell's prior experience at electronics facilities led him to believe that Rohr should encounter only one or two MRB items per week at Riverside. In the electronics industry, nonconforming parts typically are scrapped and replaced with new parts, while in the airframe structures industry, it is not cost effective to scrap components. After observing that DCAS-Santa Ana was elevating many common discrepancies to major nonconformances, Mr. McNamara and Rohr concluded that the DCAS-Santa Ana inspectors were not capable of making MRB determinations. (McNamara, tr. 2/142-43, 174; Hall, tr. 5/72-73) Rohr also found Mr. Rumell's lack of airframe manufacturing experience to be detrimental to his understanding of Rohr's adhesive bonding operations. (Hall, tr. 5/72)

Rohr also argues that based on the Hammond study (*infra*, Rohr's Withhold Tag Study (The Hammond Study)) of withhold tags elevated to SMRRs between January 1988 and December 1991, Mr. Simpson elevated a large percentage of withhold tag discrepancies as SMRRs for Grumman and NAVPRO review despite his experience. During the period Mr. Simpson elevated 342 discrepancies. In 170 instances, or 49.7 percent of the cases, Mr. Simpson did not determine whether the condition was a major or minor nonconformance; instead he "deferred to PCO." (Hammond, tr. 13/212-13; Simpson, tr. 7/20; ex. A-442 at 21) Mr. Simpson's deferral required Grumman and NAVPRO, not the local DCAS office, to review Rohr's recommended disposition on each withhold tag. How many of the discrepancies could have been dispositioned without referral is not known. However, as Rohr demonstrated during the hearing, NAVPRO agreed with Rohr's dispositions 99 percent of the time. (Hammond, tr. 13/188, ex. A-441 at 8)

We recognize that the DCAS inspectors' approach to the inspection process was certainly shaped by their prior experience. However, the impact of any initial lack of experience and the effect of on-the-job training is not measurable with any specificity. We

address the impact of the inspectors' experience only in the context of assessing the overall impact of DCAS-Santa Ana's actions on Rohr.

6. Change in the Definition of Repetitive Discrepancy

Prior to 1988, Rohr and DCAS-San Diego defined a repetitive discrepancy as an identical nonconformance occurring on the same part number, attributable to the same cause, at the same location on the part, which is repeated more than once in a six-month time span. When Rohr determined that a nonconformance was repetitive, it was required to note the discrepancy on a withhold tag and take positive corrective action. Corrective action could involve, for example, changing the design, tooling, or work instructions to prevent the nonconformance from recurring. (J. Wilson, tr. 3/207-08; Dunkel, tr. 5/29; Vandecar, tr. 5/184; Reed, tr. 8/42-44; Baker, tr. 11/177; exs. A-24, -25)

DCAS-San Diego permitted Rohr to make a repair and deliver F-14 hardware to Grumman even though the corrective action indicated on the withhold tag had not been completed. DCAS-San Diego did not require Rohr to complete corrective action before it shipped units to Grumman because the corrective action applied to future units to be manufactured, not to the hardware on which the discrepancy occurred. (Llinares, tr. 2/100; McNamara, tr. 2/175; Baker, tr. 11/162-63)

DCAS-Santa Ana and Rohr disagreed on how to apply the definition of repetitive discrepancy to bonded components. (Hall, tr. 5/110; Simpson, tr. 6/228-29; Reed, tr. 8/172; R4, tab 11 at 5) Rohr and DCAS-San Diego interpreted repetitive discrepancies to mean in the same location of a component because nonconformances which occurred in different locations likely arose from completely unrelated causes. DCAS-Santa Ana expanded the definition of repetitive discrepancy by eliminating the requirement that the nonconformance occur in the same location. (Hall, tr. 5/90; Rumell, tr. 6/103-04; T. Perez, tr. 11/27-28; Dunkel, tr. 5/30-31; Reed, tr. 8/46-47, 110-11)

At a meeting with Rohr on 27 January 1988, Mr. Rumell stated that he did not agree with the way Rohr counted repetitive discrepancies. On 12 February 1988, Mr. Rumell told Rohr that although Rohr was documenting repetitive discrepancies in accordance with its procedures, he believed the Rohr procedures were wrong and he threatened not to sign any withhold tags which contained discrepancies he viewed as repetitive. (Hall, tr. 5/90; exs. A-62, -77)

DCAS-Santa Ana followed through on Mr. Rumell's objections. DCAS refused to sign withhold tags with conditions viewed as repetitive, and Rohr was unable to work on the affected parts until formal MRB action had been completed. Left with no practical alternative, Rohr changed its definition of repetitive discrepancy on 7 June 1988, and removed the requirement that the nonconformance be in the same location. (Reed, tr. 8/44-45; T. Perez, tr. 11/27-28; ex. A-26, at 12)

The Government acknowledges that DCAS-Santa Ana changed the definition of repetitive discrepancy for Lots 19 and 20, but argues that for Lot 21 there was no change because MIL-STD-1520A was in effect in the prime contract. (Gov't prehearing br. at 9; Gov't br. at 11) Rohr has maintained and we have accepted that it complied with MIL-STD-1520A during the claim period. MIL-STD-1520A, §§ 3.16, 3.17, requires a nonconformance to appear as a "specific characteristic" of a part or process. As Mr. Reed testified, Rohr had interpreted the "specific characteristic" requirement of MIL-STD-1520A to mean a "location" requirement for the definition of repetitive discrepancy. (Reed, tr. 8/109-11; R4, tab 11) In our view, the specific characteristic requirement "as practiced" by the parties was understood to mean a location requirement.

In addition, two DCAS inspectors and the two NAVAIR F-14 contracting officers admitted that the change in the definition of repetitive discrepancy constituted a change in practice between DCAS-San Diego and DCAS-Santa Ana, without any limitation to specific lots. (Vandecar, tr. 5/169; Guiles, tr. 7/168-69; Blumenfeld, tr. 9/144, 159-60; Corning, tr. 9/183, 191, 202, 209, 219, 10/10, 11; exs. A-354, -362, -390) Consequently, we are not persuaded that Lot 21 should be excluded from consideration.

The DCAS-Santa Ana's change in practice resulted in increased findings of repetitive discrepancies for common nonconformances, which required Rohr to put them on a withhold tag for formal corrective action. One of the contracting officers, LCDR Corning, acknowledged that the impact of the change in definition caused an increase in the quantity of Rohr's withhold tags. (Corning, tr. 9/184, 199-200) This change also increased the amount of required corrective action and root cause determinations. Rohr was required to assign additional manpower to its Corrective Action Board to perform the increased quantity of cause and corrective action analyses. (A corrective action board is a required contractor board composed of management representatives from various functions with the level of responsibility and authority to assure that causes of nonconformances are identified and corrective actions are effected by the responsible managers.)

7. Change in the Definition of Major and Minor Nonconformances

In April 1988, DCAS-Santa Ana changed the definition of major and minor nonconformances that Rohr and DCAS-San Diego had used for the first 18 years of the F-14 program. The Government does not contend otherwise. Indeed, the two NAVAIR F-14 contracting officers, who evaluated the situation, admitted that the DCAS-Santa Ana change in the definition of major nonconformance constituted a change in practice. (Blumenfeld, tr. 9/141, 161-63; Corning, tr. 9/188-89, 10/10-11; ex. A-343 at 18; exs. A-354, -390)

In a 5 April 1988 Quality Assurance Representative (QAR) correspondence, DCAS-Santa Ana advised Rohr that all MRB actions which exceeded the parameters of standard repair procedures would be considered Type I major nonconformances. A major

nonconformance had to be referred to Grumman and NAVPRO for resolution. Mr. Dunkel testified that if he had been consulted, he would have considered this DCAS-Santa Ana action to be a violation of MIL-STD-1520 (Dunkel, tr. 5/20; Reed, tr. 8/18-20; ex. A-105).

In early 1988, DCAS-Santa Ana categorized a certain group of nonconformances as "process discrepancies." Process discrepancies involved processing problems, such as "positive pressure" and paint primer thickness, as contrasted with dimensional discrepancies. DCAS-San Diego had allowed Rohr to treat these types of discrepancies as minor nonconformances, because laboratory tests or other data often confirmed that the affected parts met contract requirements. DCAS-Santa Ana, however, considered all process discrepancies to be major nonconformances. This interpretation did not change until the Operating Guidelines were implemented in July 1990. (Reed, tr. 8/25-27)

Rohr MRB Engineering developed "worst case" conditions for each process violation and prepared plans establishing appropriate rationales demonstrating that each condition met contract requirements. (McNamara, tr. 2/191, 198-200; Roadick, tr. 4/84-87; ex. A-150 at 100-03) Because the process violations were considered major nonconformances, Rohr and Grumman generated "Process SMRRs" for each of Rohr's 16 deliverable F-14 components. Each time DCAS-Santa Ana rejected a part for a process violation, Rohr added it to the appropriate Process SMRR and recorded it. (McNamara, tr. 2/198-200; Roadick, tr. 4/84-87; ex. A-150 at 110, exs. A-257, -258)

Rohr could not ship hardware which was recorded on a Process SMRR until Rohr demonstrated that the worst case condition for that part had been identified and could not be exceeded. Typically, determining that a worst case condition could not be exceeded meant that all work in process had been completed and presented to DCAS for acceptance. Rohr and Grumman were confident that Rohr's work in process cited for process violations met all of the specification requirements and ultimately would be accepted. Since it could take up to a year for Rohr to establish some of the worst case conditions, Grumman, with the approval of NAVPRO, developed Tracking SMRRs. Tracking SMRRs allowed Rohr to ship completed hardware to Grumman prior to closing a Process SMRR. Although Grumman incorporated Rohr's components into its manufacturing line, it could not ship the hardware to the Navy until the Process SMRRs were closed. (McNamara, tr. 2/201-02; Roadick, tr. 4/88-89; exs. A-291, -298)

On 12 August 1988, Rohr notified Grumman that DCAS-Santa Ana's new definition of major and minor nonconformances was causing a major impact on Rohr's delivery schedule since it effectively eliminated Rohr's MRB authority to disposition minor nonconformances, and required all nonconformances to be processed on SMRRs. Rohr further stated that Grumman and NAVPRO must provide MRB personnel at Rohr Riverside in order to meet any future F-14 schedule commitments because full MRB authorization was critical to the F-14 line flow. On 26 August 1988, Rohr notified Grumman that the DCAS actions were

continuing to impact the manufacturing line, and any scheduled delivery dates must be considered target dates only. (Llinares, tr. 2/92-97; exs. A-131, -134)

Throughout 1988 and 1989, Rohr attempted to resolve its disagreement with DCAS-Santa Ana on the definition of major and minor nonconformances. There is a question of when this matter was resolved. There was a 6 December 1989 meeting involving representatives of Rohr, DCAS-San Diego, and DCAS-Santa Ana. Mr. Tony Reed, who was at the meeting, testified that the purpose of the meeting was to address the definition of major and minor nonconformances, and that at the conclusion of the meeting, DCAS-Santa Ana agreed to revert to the definition that had been employed by Rohr and DCAS-San Diego prior to the 24 January 1988 change in cognizance. A Rohr memorandum of the meeting (ex. A-281) shows that the parties also discussed the subject of whether a major nonconformance could be repaired and reduced to a minor nonconformance, which DCAS could disposition. There was an internal disagreement among the DCAS representatives. Ultimately, it was agreed that DCAS-Santa Ana would revise its interpretation and allow a major nonconformance to be repaired and reduced to a minor, which could then be dispositioned by DCAS. (Reed, tr. 8/37-41, 130-32) Based on our review of the record, we credit Mr. Reed's testimony.

Rohr was not permitted to work on parts elevated to major nonconformances until Grumman and NAVPRO had reviewed and dispositioned the SMRRs. Mr. Samuelson and Mr. Simpson, DCAS-Santa Ana inspectors, told Rohr that continued work on the parts would increase the value of a nonconforming part, and thus would put undue pressure on NAVPRO to accept the part. In February 1990, Rohr was allowed to work at its own risk on parts elevated as major nonconformances, but only after Grumman had approved Rohr's proposed engineering disposition. (Reed, tr. 8/21-24; ex. A-293)

This change was a major contributor to the increase in the number of withhold tags elevated to Grumman and NAVPRO for resolution and had a significant effect on Rohr. The impact of this change is discussed in connection with Item 15. Elevation of Withhold Tags to Grumman and NAVPRO as Major Nonconformances, *infra*.

8. Performance of Unreasonable and Inconsistent Inspection of Planning Documentation

There were a total of 56 ASO books for one inlet and glove. Approximately 300 Rohr employees had manufacturing responsibilities for the various F-14 components, and at least 50 employees made entries in the 56 ASO books for one inlet and glove. The 56 ASO books contained thousands of entries. DCAS-San Diego's practice was to review only the three final ASO books. Grumman and Rohr witnesses testified that Rohr's ASOs produced acceptable hardware. If a problem arose, Rohr typically corrected it immediately. The other ASO books were audited during in-process inspections under the PVI approach. The time for final inspection of the three books for an inlet and glove took from three to four hours depending

on who performed the inspection. DCAS-San Diego was also sensitive to Rohr's scheduling concerns in comparison to DCAS-Santa Ana. (McNamara, tr. 3/12, 13/17-18; Simpson, tr. 6/210; T. Perez, tr. 11/46, 51; Baker, tr. 11/170)

On 31 October 1988, DCAS-Santa Ana implemented new procedures at Riverside to examine Rohr's planning documentation. The following items were to be available for DCAS review during all final inspections on hardware:

A.) The complete Assembly Shop Order (ASO) data package of all items manufactured at Riverside Plant Only (BOND and MECHANICAL);

B.) The top assembly drawing for the hardware being inspected.

C.) All applicable M.R.B. Withhold Tags to ensure that they are closed.

D.) Applicable process specifications will be requested as required by the Assembly Shop Order (ASO) operations.

E.) All Documentation will be examined prior to Physical part inspection.

(Ex. A-146) At that time, Rohr provided all 56 ASO books for each inlet and glove to DCAS-Santa Ana at final inspection (Simpson, tr. 6/211; exs. A-146, -190).

The Government offered testimony that DCAS-Santa Ana used a statistical sampling procedure in accordance with MIL-STD-105 in reviewing Rohr's ASO books for an inlet and glove. Under these procedures with an acceptable quality level of 1.0, the statistical sample size was 13 books selected randomly. This quality level also meant that DCAS-Santa Ana rejected a Rohr part if it found one error in the 13 ASO books. (Samuelson, tr. 20/233-35; Simpson, tr. 7/43; Guiles, tr. 7/137-39, ex. A-159) If DCAS-Santa Ana rejected any of the 13 ASOs, it returned all 56 ASO books to Rohr to correct the identified errors. When Rohr presented the corrected ASOs to DCAS-Santa Ana for re-auditing, the inspectors on many occasions chose a different sample of 13 ASO books to review. (Hammond, tr. 14/28-31)

There is uncertainty and some conflicting evidence as to how, and even when, the sampling procedures were implemented. However, the evidence clearly shows that DCAS stepped up its review and scrutiny of the ASOs in contrast to the practice under DCAS-San Diego and did not follow the sampling procedures outlined above at all times. The appellant has pointed to a December 1988 QDR, which memorializes a review of "58 [sic] ASOs submitted to DCAS for final inspection." The QDR reports a rejection of 12 ASO books due to "numerous errors" after a review of 27 books, and a decision by DCAS to discontinue review of the remaining ASOs. (Ex. A-159; Samuelson, tr. 20/237) The finding of

discrepancies in one or more ASO books was not supposed to stop the DCAS review. Mr. Guiles testified that he stopped this practice within a few days of discovering it, but he did not state when that was. (Guiles, tr. 7/137)

Mr. McNamara also testified that when Grumman's personnel arrived at Riverside in March 1989, DCAS-Santa Ana inspected 100 percent of the 56 ASO books presented for each inlet and glove. If there were problems, "all 56 [ASO books] would be recycled." Mr. Richard Luksza, who was Manager of Quality Assurance for Assembly at Rohr Riverside from April 1989 through the claim period, occasionally sat with the DCAS-Santa inspectors during their ASO audits. He confirmed that when he arrived in April 1989, DCAS-Santa Ana audited 100 percent of Rohr's ASO books. Mr. Hammond also testified that in "early" 1989, he witnessed DCSA-Santa Ana inspectors auditing all of Rohr's ASO books. He recalls DCAS-Santa Ana using the statistical sampling method in "mid-1989" because of a backlog. (McNamara, tr. 3/14-17, 119-20; Luksza, tr. 10/99, 103-05, 167-68, 173-75, 184; Hammond, tr. 14/26-29) On 12 July 1989, DCAS-Santa Ana reduced the sample size from 13 to 5 and, thereafter, consistently followed this practice (R4, tab 248; Samuelson, tr. 20/236-37).

Though we need not conclude that all ASO books were reviewed, or that only 13 were reviewed, to sustain Rohr's point, we are persuaded that from the end of October 1988 through the first half of 1989 DCAS was inspecting virtually all of Rohr's ASOs. In reaching this conclusion, we have evaluated the testimony of Messrs. Simpson, Guiles, and Samuelson on the question of review of the ASO books and do not find it persuasive in this regard.

DCAS-Santa Ana's review of Rohr's paperwork increased the time required for final inspection. DCAS-Santa Ana's review of the ASOs took one to three days and on occasion longer, in contrast to the several hours under DCAS-San Diego. (Guiles, tr. 7/135, 189) Hardware was on hold while Rohr tried to resolve DCAS-Santa Ana's problems with the paperwork. The impact was not limited to the increase in the final inspection time. Rohr added six days to its anticipated delivery schedule to account for DCAS-Santa Ana's review of the paperwork at final inspection. The six days allowed for the following steps to be performed: Rohr manufacturing's review of the bond shop and mechanical ASOs; Rohr quality's review of the same ASOs; Grumman's review of the same ASOs; Rohr's listing of the part on a call sheet for DCAS inspection; a 48-hour response time for DCAS to respond to the call sheet; DCAS ASO review, including return of the ASOs to Rohr with discrepancies identified; Rohr efforts to obtain objective evidence or change entries to satisfy DCAS; and re-initiation of the planning audit process by Rohr, Grumman, and DCAS. (McNamara, tr. 3/15; Luksza, tr. 10/106-11, 113, 117; T. Perez, tr. 11/46-48, 59-60; Hammond, tr. 13/234, 14/12, 15, 25-26, 30-31)

9. Changes to Rohr's Planning Documentation Through Demands for Additional Objective Evidence of Specification Compliance

MIL-Q-9858A required Rohr to "maintain and use any records or data essential to the economical and effective operation of [its] quality program" and to make these records available for Government review as "objective evidence" of hardware quality. (R4, tab 12, ¶ 3.4) Rohr set up an elaborate system of work instructions to comply with MIL-Q-9858A including ASOs, QADIs, engineering drawings and specifications. (Susil, tr. 8/179-80)

Rohr's work instructions for the manufacture and inspection of each component are contained in ASOs. The ASO contains step-by-step instructions for each mechanic's function and each inspector's function. A manufacturing stamp placed next to an instruction in the assembly process signified that the mechanic performed the operation and fulfilled the requirements of the planning documentation. A quality stamp signified that a quality inspector inspected the function performed by manufacturing and found the part acceptable. QADIs contain specific procedures that govern Rohr's stamping processes. Rohr primarily relied on its system of stamping the work instructions in the ASOs as objective evidence that F-14 hardware was built to specification requirements.

Both DCAS-San Diego and Grumman audited and approved of Rohr's planning documentation, and accepted Rohr's system of stamping the planning documentation as objective evidence of compliance. Mr. McNamara confirmed that Rohr's F-14 planning produced acceptable hardware for the first 18 years of the F-14 program, and he saw no reason to change the system. (Susil, tr. 8/179-80; McNamara, tr. 2/185-87; Guiles, tr. 7/161; Baker, tr. 11/169)

The evidence shows that after the change of inspection cognizance to DCAS-Santa Ana, planning that was considered acceptable to DCAS-San Diego was considered deficient by DCAS-Santa Ana. DCAS-Santa Ana interpreted "objective evidence" to require significantly more detail in the ASOs. Rohr previously had not included extensive detail in its planning, and much of the information that DCAS-Santa Ana requested had not been recorded. (Carter, tr. 2/28-32; Roadick, tr. 4/53-54; McNamara, tr. 2/188-90) At the hearing, Rohr's witnesses characterized DCAS-Santa Ana's review of the planning as "inspecting to reject" and we think this is a fair characterization. (T. Perez, tr. 11/60-61, Hammond, tr. 14/34-37) As one Rohr witness explained the situation, in the past objective evidence had been the application of a stamp to an operation. After the change Rohr was getting requests for evidence that proved "beyond a shadow of a doubt" that a process was done within its timing, within its requirements under an engineering specification. Moreover, DCAS was basically requesting the information for all components, from "bond assemblies right on up through mechanical assemblies on the inlet and glove." (Susil, tr. 8/182-85) Grumman's Mr. Linares, with 37-years experience in dealing with suppliers, testified that he never saw "auditing to that degree on any product in any company." In his

view, the review was "punitive." (Llinares, tr. 2/91-92) Rohr tried to deal with the issues on a case-by-case basis, but was ultimately forced to seek a more comprehensive solution.

Initially, DCAS-Santa Ana's rejections of Rohr's planning focused on illegible stamp entries. Over time DCAS-Santa Ana's auditing of Rohr's paperwork at final inspection intensified. Illegibility issues were no longer limited to smeared stamps, but now included upside down or "light" stamps. DCAS-Santa Ana required Rohr's manufacturing stamps to have "M" dates. Dates and times had to be written in a specific format. For example, dates written "1-1-89" were accepted, whereas dates written "1 January 1989" or "1/1/89" were rejected. Additionally, times entered as "10:00 PM" were accepted, while times entered as "10:00 pm" or "10 PM" were rejected. For one inspector the planning had to be in black ink, not blue ink, and had to be dark enough to produce four generations of legible copies. On the other hand, there were instances of missing stamps, stamps in the wrong place, and simple errors in data entry. (Hammond, tr. 14/5-22; T. Perez, tr. 11/52-58; exs. A-492, -493)

If, for example, a stamp was smeared, so that a Rohr employee number or an inspector's initials were illegible, DCAS-Santa Ana considered it a process violation and would not accept the stamp as evidence that Rohr properly performed the underlying operation. Rohr was then left with two choices: search for supplemental back-up documentation to prove that the operation was properly performed; or if the back-up documentation was unavailable, write a withhold tag and obtain an MRB disposition proving that the part conformed to the specifications. (Lounsbury, tr. 9/34-35; Hammond, tr. 14/13-15)

The change in approach from that employed by DCAS-San Diego is traced initially to a February 1988 DCAS Quality Systems Review at Riverside. As a result DCAS-Santa Ana issued QDRs to Rohr for the lack of sufficient detail in its planning. DCAS-Santa Ana also issued QDRs, such as QDR Nos. 88-49A, 88-78A, and 88-92A, discussed below, for Rohr's lack of sufficient objective evidence. (McNamara, tr. 2/191-92; Roadick, tr. 4/66-73; exs. A-88, -98, -120, -142, -159)

On 4 March 1988, Grumman issued Seller Corrective Action Request (SCAR) 6711 to Rohr for deficiencies found in the inspection tasks for final acceptance of inlet and glove assemblies. Grumman requested that Rohr provide new corrective action addressing how Rohr would capture defects before they were presented to Grumman at final inspection since the prior corrective actions were not working. Several deficiencies in the documentation required for final acceptance were noted. (R4, tab 82 at bates 000339)

In May 1988, DCAS-Santa Ana issued QDR 88-49A, noting that during final inspection of a ventral fin, the inspector questioned the documentation of primer application completion time and oven cure time and temperature. Subsequent examination of the oven cure chart indicated that the cure was invalid due to temperature fluctuations outside permissible limits. A cure date was also missing, so there was no way to verify operation

requirements. On further examination several days later, three units were observed in the oven with undocumented ASOs requiring a temperature start and end date and a time stamp indicating completion of the process. (Ex. A-120)

Rohr responded to QDR 88-49A in June of 1988. Rohr traced the cure time problem to excessive opening of the oven doors during the cure cycle. It instituted a log book system to record all hardware going into the oven by time in and time out, instructed its employees on the use of the log, and heightened supervision. (Ex. A-120)

In June Rohr also responded to SCAR 6711. On 21 June 1988, it identified "Planning and I/P errors" as one of the causes of its increasing defect level. It also listed inadequate training and insufficient supervision. Other causes identified included: 20 new employees added to recover schedule delinquency; details and subassemblies received with discrepancies; employee turnover due to seniority; MRB delays increased transfers out of proper station; incorporation of A+ configuration. Rohr proposed action plans for "Administrative Improvements" and "Hardware Improvements." (R4, tab 82 at bates 000337-000338)

One of the administrative improvements listed by Rohr in its F-14 Quality Action Plan was a change from its existing "stationized" planning to a sequential planning system or production operation log system which would specify all operations in detail. Rohr also indicated that additional supervision and support personnel had been added. Rohr proposed the change to sequential planning to address DCAS-Santa Ana's "difficulty understanding the structure of the assignment planning." (Baker declaration, R4, tab 7, encl. 21 at ¶ 36; R4, tab 82 at bates 000350)

On 19 October 1988, DCAS issued QDR 88-78A for Rohr's failure to follow contract specifications and Rohr Quality Assurance Department requirements for verification that manufacturing operations complied with planning requirements and that all product submitted for acceptance to the Government would meet contract requirements. During final inspection of a panel assembly ramp, the following deficiencies were noted: no annotation on the planning document of time and drying requirement for epoxy coat; sealant application date and time and curing requirements not annotated on ASO; application date, time and drying requirements for epoxy primer not shown and planning incomplete because it only calls out batch, expiration date and time. Rohr was also cited for production and acceptance stamps that were improperly voided in accordance with Rohr procedures. In reply, Rohr noted that its planning was in error and that its planning was in the process of being revised to include curing information and recording spaces. Rohr also advised that all affected employees were instructed on the procedures for voiding stamps. (Ex. A-142)

On 21 November 1988, Grumman issued SCAR 6819 to Rohr for discrepancies found during review of the planning for the inlet and glove for aircraft No. 584. The discrepancies identified included "inaccurate/erroneous entries, inconsistent data recording requirements

for the same process functions, and insufficient data recorded in order to verify compliance to the process specifications being implemented." Mr. McNamara, who signed the SCAR, observed that this was a "generic problem," not limited to the particular aircraft or the inlet and glove assembly. (R4, tab 157)

Grumman requested Rohr to provide cause and corrective action for five planning system areas identified as "ineffective" by Mr. McNamara. These areas involved: manufacturing engineering's initial inputs and change control to the planning for consistency and completeness of requirements; quality engineering's responsibility to assure that the initial planning and changes demonstrate compliance to the process being implemented; manufacturing's responsibility to assure that the initial planning and changes demonstrate verification of compliance to the process being implemented; inspection's responsibility to verify that manufacturing is following the planning and that the data documented verifies compliance with the planning requirements; and a quality audit of the completed planning books prior to "sale of the hardware." In these last two areas, Grumman noted that the discrepant books had been reviewed and stamped as acceptable by inspection and reviewed and accepted by quality audit. Grumman also noted that in some of the areas discussed, an adequate supplemental control and recording system would meet the verification and control requirements without having to enter data on the planning document itself. (R4, tab 157; ex. A-153)

In response to SCAR 6819, and to DCAS-Santa Ana's requests for additional objective evidence, Rohr developed Corrective Action Plan CA111488 in November 1988. The issue, as identified in the plan, was the adverse impact to hardware shipments by "apparent errors and omissions within the planning data package ranging from errors in data entry to process control data not appearing in the body of the planning." The plan proposed both short-term and long-term corrective action. Interim corrective action was necessary to keep Rohr's manufacturing line moving until the long-term corrective action could be implemented. Though initiated in November, the plan was updated during the following months. A key feature of the long-term solution was the establishment of a Planning Rewrite Team.

In the area of manufacturing engineering, Rohr's response identified the root cause of the F-14 planning discrepancies as twofold: first, tightening of compliance criteria and the lack of review to meet the tightened criteria; and second, specific controls were not in place to insure that requested planning changes did not affect the consistency of the original planning release.

In the area of quality engineering, Rohr advised that as an interim action all planning was being reviewed prior to submittal to DCAS and deficiencies addressed as appropriate. Also, it had created generic block stamps to be placed on the back of ASOs to record additional information and provided training on data entry and the use of block stamps. As a final resolution, quality management was going to develop a system of quality review that

would ensure that original planning and subsequent revisions met contract requirements. (R4, tab 157 at 8)

In the area of manufacturing, Mr. Baker, Director of Rohr Riverside Assembly Operations, candidly responded on behalf of his area that the cause of the deficient condition was a "[l]ack of total understanding of what is required and insufficient shop discipline." (R4, tab 157 at 16) In the manufacturing area, Mr. McNamara also questioned the absence of corrective action in the bond shop, which he "considered the worst offender on this problem." (R4, tab 157 at 3) Mr. Terry Tomerlin, Manager, Adhesive Bond, identified the causes of the "discrepancy" as inadequate training of employees, inadequate discipline in employee data entry and in the area support systems providing data to the bond shop. (R4, tab 157 at 32)

On 2 December 1988, DCAS-Santa Ana issued QDR 88-92A. The QDR noted that during a DCAS audit of an ASO package for an inlet and glove assembly, 27 ASOs were inspected and 12 were rejected due to numerous errors. At that point, DCAS discontinued review of the remaining ASOs. In a 22 December 1988 response, Rohr acknowledged "[i]naccurate or incomplete planning requirements," and the "complete absence of shop disciplines on data requirements per established Rohr manufacturing procedures." The response identified a number of actions that Rohr was taking to address the situation. First, all "finalled out" planning in the Audit Department was being reviewed by a planning audit team composed of representatives from quality assurance, manufacturing engineering, and manufacturing and led by a representative from quality engineering. The team was identifying and documenting all process and discipline deficiencies for educational follow-up. Second, a primary audit team had been established at the floor level to review all planning for process and discipline errors, thereby serving as an educational program for all quality assurance and manufacturing personnel. Also, special planning review sheets were adopted to help ensure consistency. In addition, a sign-off sheet for quality assurance supervisors, who were responsible for planning in their area, was adopted and was to accompany all finalized planning forwarded to the Audit Department. Finally, Rohr noted the establishment of the Planning Rewrite Team to revise all military planning "to meet all respective requirements." (R4, tab 165)

As indicated, Rohr's long-term solution was to review and rewrite the planning for all of Rohr's military programs through the use of a Planning Rewrite Team. Rohr decided to revise the planning for the F-14 program first because its 600 separate plans comprised the largest amount of planning of any of Rohr's military programs, and because DCAS-Santa Ana's actions affected it the most. In November 1988, Rohr formed the Planning Rewrite Team to review the F-14 planning in detail and to rewrite the planning to satisfy DCAS-Santa Ana's demands for additional objective evidence. (McNamara, tr. 2/191; Roadick, tr. 4/66-73; Guiles, tr. 7/210; Susil, tr. 8/190, 195-97; exs. A-88, -98, -120, -142, -150 at 22, 39, exs. A-159, -163)

The Planning Rewrite Team had a core of five or six Rohr employees. In addition, Rohr hired up to 21 contract manufacturing engineers to help with the analysis and rewrite of the planning. On average Rohr had about 15 full-time employees devoted to the effort. (Susil, tr. 8/188-89)

The first step in the planing rewrite effort consisted of researching each of the F-14 manufacturing operations and identifying all of the objective data that could possibly be requested to support each operation. Rohr's Planning Rewrite Team developed a generic planning model to guide each of the departments participating in rewriting the F-14 planning to include objective evidence. (Susil, tr. 8/199-202; ex. A-154)

The next step of the F-14 planning rewrite was to review, update, and create, where necessary, supplemental documentation systems. This step addressed the objective evidence required by DCAS-Santa Ana for Rohr to maintain in its floor control documentation to support ASO stamp entries. (Susil, tr. 8/202-06; ex. A-158)

The final step was the actual rewriting of the F-14 planning. As part of this step, Rohr issued new Manufacturing Process Digests (MPD). An MPD simplified specific processes so that employees in manufacturing areas had supplemental instructions for the operations required by the ASO. Rohr's Materials and Processes (M&P) Engineering and Quality Departments assisted the Planning Rewrite Team in carrying out this step.

As proposed in CA-111488, by 17 January 1989, Rohr began a phased release of over 600 revised F-14 plans to the production floor. The phased release of new plans created confusion about which ASOs on the floor continued to require block stamps, and in March 1989, Rohr reissued its block stamp instruction memorandum. (Susil, tr. 8/204, 207-11, 217, 218; exs. A-160, -164, -165, -173, -174, -175, -189)

Rohr implemented an extensive training program on the use of the new planning. Rohr created separate training manuals for mechanical assembly and bond assembly personnel because the bond operations were process-intensive and sensitive to error. In addition to training each Rohr production employee, Rohr trained Mr. McNamara, and DCAS-Santa Ana representatives, Mr. Samuelson and Mr. Guiles, on the new planning. Rohr also trained its F-14 vendors on the new planning requirements, because some of the objective evidence DCAS-Santa Ana requested was to be provided by Rohr's vendors. (Susil, tr. 8/212-16; exs. A-177, -180, -183)

In addition, in an effort to keep the hardware moving, Rohr established a special team, known as the Planning Audit Team, in November 1988 to review 100 percent of the ASOs before presenting them to DCAS-Santa Ana. This paralleled a Grumman effort, initiated by Mr. McNamara, to review 100 percent of the ASOs before they were presented to DCAS. Rohr and Grumman undertook this effort to address the discrepancies that DCAS-Santa Ana typically rejected. Notwithstanding this attempt to eliminate all "discrepancies,"

DCAS-Santa Ana continued to reject Rohr's ASOs. Rohr's Mr. Richard Luksza testified that discrepancies can always be found in the planning, no matter how many times the ASOs are audited. (McNamara, tr. 3/15-16; Luksza, tr. 10/109-13; Hammond, tr. 13/228-31; ex. A-138)

In March 1989, Rohr's Planning Rewrite Team began a second phase to the planning rewrite, which lasted through 1990. The second phase focused solely on Rohr's Bond Shop, where Rohr was continuing to have the greatest difficulty in satisfying DCAS-Santa Ana. (Susil, tr. 8/221-23; ex. A-197 at 27, 46) As previously noted, Mr. McNamara considered the bond shop the "worst offender" and Rohr's Mr. Tomerlin had traced the problems there to inadequate training of employees, inadequate discipline in employee data entry and to the area support systems providing data to the bond shop.

In June 1989, Rohr issued an Assembly Planning Instruction Manual to direct employees on how to complete F-14 planning. Rohr provided copies of the draft manual to DCAS-Santa Ana and Grumman and asked them for comments. Rohr conducted an extensive training program on the contents of the manual, either by personal or video instruction, to approximately 2,000 employees. Both the manual and the instruction video clarified the legibility issues that had arisen between Rohr and DCAS-Santa Ana in filling out the planning. There is some evidence that DCAS-Santa Ana took a literal approach to the manual and questioned even minor deviations from it. This prompted Rohr to review the training manual with DCAS representatives to emphasize that the manual was meant to be instructional, not mandatory. The scope of this problem is not established. (Lounsbury, tr. 9/25-26, 30-33, 38-40, 46-51; T. Perez, tr. 11/64-66, 70; Gordon, tr. 12/240-42; ex. A-214)

Beginning in mid-October 1989, Rohr developed "sample paths" for each F-14 part number. A sample path was a planning model or "recipe book." The sample paths were to be used to show Rohr's personnel how to write F-14 specific planning. Rohr drafted the sample path and then gained Grumman's approval. The sample path was then used to build the part in a test run of the new planning through the F-14 process. Rohr, Grumman and DCAS-Santa Ana approved each sample path before Rohr released new planning. Rohr's goal was to get a consensus on what objective evidence was required in order to avoid another bond shop shut down (*infra*). After the sample path was approved and "locked in," Rohr revised F-14 ASOs that previously had been issued to the manufacturing floor to incorporate the new requirements. Rohr also had to change its planning system to make certain that any subsequent plans released to the floor would include everything called for by the sample path. (McNamara, tr. 2/205-06; Susil, tr. 8/223-24; Blank, tr. 13/76-78; ex. A-396)

Mr. Steven Blank, a Rohr Product Quality Engineer for the F-14 program, testified that the sample path procedure had a significant impact. Rohr's work in process could not advance past the point in the production process where the parties had agreed on the sample path, and a bottleneck resulted in Rohr's F-14 hardware flow. Once Rohr completed the sample path, hardware flow did not immediately return to normal until Rohr cleared the

bottleneck. This took time because the F-14 manufacturing line could process only certain quantities of parts through a cost center due to the limited capacity of Rohr's facilities and tooling. (Blank, tr. 13/79, 95; ex. A-438 at 238-40, 273-74, 290-92)

Throughout 1989 Rohr continued to receive QDRs from DCAS-Santa Ana for lack of sufficient objective evidence in its planning. In addition, a summary of DCAS-Santa Ana's Method A Log reveals that 80 percent (102 out of 127 entries) of the Method A verbal rejections issued in 1989 related to planning documentation issues. (Roadick, tr. 4/57-65, 77-81; Susil, tr. 8/219-23; exs. A-184, -212, -218, -393, -394) After DCAS-Santa Ana's withdrawal from MRB participation on 30 August 1989, Grumman continued to issue SCARs to Rohr. The Government has pointed to 13 SCARs that were issued between the issuance of the Method C and the end of the claim period. Several identified a failure to provide objective evidence or errors in the planning or the failure to provide corrective action for deficient planning. (G-178, tab U)

There is no evidence that DCAS ever "ordered" Rohr to rewrite its ASOs. Mr. Samuelson testified that when he learned in October 1988 during a meeting with Mr. Jim Hall, Rohr's Quality Director, and Mr. Watson, Vice President Quality, that Rohr was planning a rewrite, he expressed surprise and later emphasized that DCAS was not telling Rohr to rewrite the planning. His view, expressed at the time, was that Rohr's planning was some of the best he had ever seen. Messrs. Guiles and Simpson also testified to their belief that the planning documentation in the ASOs was fine. The problem was getting Rohr manufacturing and quality personnel to make the proper entries. (Simpson, tr. 7/46-47; Guiles, tr. 7/204; Samuelson, tr. 20/227-28, 233)

At the hearing, Mr. Samuelson also testified to an instance where the revised planning contained less detail than before and he believed that there was generally less information in the planning than before. (Samuelson, tr. 20/229-30) We are not persuaded by his general assessment, although a need to revise the planning is not incompatible with a decision to dispense with unnecessary information. On the other hand, Rohr identified 43 different types of supplemental records that were either created or revised between 1988 and 1990 to meet DCAS-Santa Ana's objective evidence requirements. The manufacturing area most affected by this requirement was Rohr's Bond Shop. (Carter, tr. 2/31; McNamara, tr. 2/194, 210-11, 3/10, 101-02, 137-38; Susil, tr. 8/201-02; T. Perez, tr. 11/59; Hammond, tr. 14/57-110; exs. A-450 to -493)

In addition, Rohr presented representative examples of Rohr's F-14 planning for a typical inlet and glove during three time periods: February 1988, April 1989, and February 1990. The thickness of the ASO package grew from 9 inches in February 1988, to 15 inches under DCAS-Santa Ana in April 1989, to 19-1/4 inches under DCAS-Santa Ana in February 1990. Rohr attributed the size difference to the added instructions and objective evidence required by DCAS-Santa Ana. (Hammond, tr. 14/111-21; exs. A-83, -84, -85 -86)

Moreover, we are not persuaded by the Government's argument that Rohr rewrote its planning because Grumman and Rohr itself were dissatisfied with the F-14 planning, and not because DCAS-Santa Ana required more detail and information than Rohr previously had recorded. (Gov't br. at 32) Rohr's basic manufacturing process to build F-14 components was no different under DCAS-Santa Ana than it was under DCAS-San Diego. In addition, we believe that Grumman's criticisms of Rohr's planning were driven by a desire to keep the product flowing by satisfying DCAS's requests. (McNamara, tr. 2/195-97; Llinares, 2/76-83) Mr. McNamara's evaluation of the situation is instructive in this regard.

During the time Rohr was formulating its response to Grumman's November 1988 SCAR 6819, Mr. McNamara had rejected an initial response as "incomplete" because he felt the overall response was "geared to a one time fix to rewrite the planning without consideration" of changes in procedures in other areas to avoid the "problem in the future." He felt an adequate response was necessary in order to close out corrective action requirements for ten open SMRRs. The answer had to be "complete and detailed enough to be sold to my NAVPRO in New York for both interim and final corrective actions." (R4, tab 157 at 3)

Later, in a 22 May 1989 memorandum to Grumman's Director of Quality, Mr. McNamara identified several areas of concern that, in his view, could result in a "significant adverse impact" on Rohr's ability to "deliver a quality product to the proposed delivery schedules." One area of concern was the position DCAS might take in light of planning deficiencies. He made the following comments:

> DCAS Position
>
> There is a real potential for action that DCAS may take to shut down the Riverside facilities as a result of unsupported changes made to the manufacturing planning (Assembly Shop Orders - ASOs). DCAS appears to be reviewing this in conjunction with Rohr[']s claim against them.
>
> Some 1000 + ASO's had erroneous or missing data needed to prove compliance to engineering specification (B/P) requirements. (Times, temperatures, dates & data above or below spec requirements.) This resulted in thousands of corrections being made by Rohr to their ASO's. DCAS found and documented examples where changes have been made by Rohr without the supporting documentation/evidence needed to legalize these changes.
>
> This should have never happened. GASD warned Rohr not to change any documentation without the required back up

> information. GASD authorized with NAVPRO's concurrence sixteen (16) Generic seller material review reports (SMRR's) be generated to cover any out of specification conditions including missing data. These changes should have been left in the original form incorporated into the SMRR's for acceptance by engineering rational and/or testing of each worst case condition as required to disposition these SMRR's.

(R4, tab 233)

In a 21 July 1989 communication, Mr. McNamara revisited the issue in response to a Rohr allegation that since October 1988 DCAS was reviewing all the planning documentation on each unit. He reported that this action stemmed from a DCAS audit of the bond shop which found the ASOs to be inadequate. He observed that Rohr "only fixed what DCAS pointed out as discrepant resulting in many re-submittals and re-reviews." He emphasized "DCAS and GASD need ASOs to demonstrate compliance to Spec requirements or to be covered via SMRR, along with objective evidence for any changes made to the ASO." (R4, tab 265 at 3-5 (emphasis in original))

At the hearing Mr. McNamara testified that "[i]n order to have hardware manufactured, accepted, and shipped to Grumman, I had to, whether I like[d] it or not, accept the local DCAS interpretation of objective evidence because there [was] no other way to get hardware moving." In his view, he had to take whatever actions he could "to bring the raw system up to what DCAS wanted." Mr. McNamara also testified that his references to "discrepant planning" and "planning discrepancies" in SCAR 6819 were to Rohr not meeting DCAS-Santa Ana's additional objective evidence requirements. (McNamara, tr. 2/195-97) We find his testimony persuasive and conclude that Grumman would not have pressed Rohr to revise its practices if it had not been for DCAS's actions.

Based on our evaluation of the pertinent witness testimony and the documentary record, we conclude that DCAS-Santa Ana did change prior practice by its insistence on additional objective evidence. The planning rewrite effort was triggered by DCAS-Santa Ana's refusal to accept a level of objective evidence that previously had been acceptable to Rohr, Grumman and DCAS-San Diego. We further conclude that it was reasonable for Rohr to rewrite its planning in response to DCAS actions, after dealing with the issue on a case-by-case basis.

The Bond Shop Shutdown

However, Rohr's corrective actions and revised F-14 planning were not a complete success. As Rohr's and Grumman's evaluations underscore, Rohr's difficulties in satisfying DCAS-Santa Ana's inquiries were compounded by Rohr's own internal problems: inadequate discipline in employee data entry and inadequate training of employees – to name two.

Grumman's Mr. McNamara considered the bond shop the "worst offender" and Rohr's Mr. Tomerlin traced the problem there to inadequate training of employees, inadequate discipline in employee data entry and to the area support systems providing data to the bond shop.

Rohr has maintained that DCAS-Santa Ana criticisms of Rohr's planning documentation for lack of adequate information and requests for supporting data were felt most acutely in the bond shop. Rohr's bond shop was where much of the supporting process data was located. Rohr was required to search for specific data in the midst of a "vast quantity" of floor control documentation, often to answer DCAS questions about manufacturing operations that had been performed two to four months previously. (Luksza, tr. 10/115-16)

On 1 August 1989 Rohr shut down the bond shop (R4, tab 302). Rohr's purpose was to respond once and for all to DCAS-Santa Ana's requests for supporting information in the bonding operations, and to establish that the work in process in the bond shop was acceptable. There were approximately 1,000 work in process bond panels within the Riverside manufacturing environment involved. They were in various stages of the manufacturing process from the bond shop itself through final assembly. The work stoppage in the bond shop allowed Rohr to physically collect all of the paperwork in the various parts of the facility and then audit the planning documentation for each of the bond panels. (Roadick, tr. 4/91-92; Luksza, tr. 10/121-23)

Rohr established a special team, known as the Process Compliance Audit Team, and during the remainder of the month conducted an intense audit of all planning documentation for the bond parts. Rohr and Grumman agreed on a detailed plan to audit the 1,000 work in process bond panels. (Ex. A-230) A matrix was developed of the specific items that would be audited for each bond panel. (Luksza, tr. 10/123-28; ex. A-231) Rohr also developed a corrective action plan identifying the tasks that would be performed by each department. (Luksza, tr. 10/131, ex. A-245)

Rohr audited the bond panels based upon a priority system in which units ready for shipment were audited first. The audit team then worked its way back up the assembly line in the order of those panels closest to completion. The Process Compliance Audit Team worked ten-hour days, seven days per week, since production was stopped until the audit was completed. (Luksza, tr. 10/137-43; ex. A-244)

On 29 August 1989, Rohr re-opened the bond shop. The audit had not yet been completed, but there was enough work cleared for production so that the shop did not have to remain completely shut down. (Luksza, tr. 10/145-50; exs. A-250, -252, -255) Rohr's tally sheet for the bond shop audit indicates that of the 1,000 bond panels that were reviewed, 970 panels were accepted, 22 panels were scrapped, and the remaining 8 - 10 panels were tested to determine if they could satisfy a set of worst case conditions and then accepted. For the

22 scrapped panels, there were probably "some valid things wrong," but for the majority of the panels Rohr could not find the supporting paperwork. (Luksza, tr. 10/151-53; McNamara, tr. 2/199-200; ex. A-395)

Rohr's Mr. Luksza testified that even though F-14 production restarted on 29 August 1989, it took at least an additional 30 days to return to full production, and even then, the process was slower than normal until Rohr started making completely new parts with new planning documentation. He testified this did not occur until approximately March 1990. (Luksza, tr. 10/153-55)

Rohr says it reluctantly decided to shut down the bond shop and it asks us to assign responsibility for this decision to DCAS. We cannot. Rohr has argued that any contention that it would voluntarily shut down the bond shop to rewrite planning that had produced acceptable hardware for 18 years cannot be serious. The focus here is not on the planning rewrite (which we agree, and have found, Rohr would not have undertaken but for DCAS-Santa Ana's changes), but on whether the bond shop shut down was necessary and, more importantly, whether the responsibility lies with Rohr itself.

Grumman did not direct the shut down and there is evidence that Grumman did not consider it necessary. In any event, Grumman considered the shut down a Rohr decision and considered it responsible for any schedule and cost impact. (R4, tab 327)

With respect to Rohr's own responsibility, starting in April 1989, Navy F-14 aircraft delivered by Grumman and in use by the Navy suffered bond panel delaminations resulting in a reduced strength bond panel assembly. Investigation by the Navy, Grumman, and Rohr during 1989 established that the cause was an improper acid bath by Rohr personnel which overcleaned the titanium skin. (R4, tabs 327, 338) A Rohr report on the problem in October 1989 noted that five bond panel delaminations had occurred in panels that were built from August 1987 to July 1988, but the extent of the problem was unknown at the time of the report. Rohr performed an audit of work in place for process compliance and prepared visual aids of proper and improper material for its employees. Rohr employees were reinstructed on the importance of following strict processing procedures. (R4, tab 327)

By February 1990, at least 11 Navy F-14 aircraft had bonded panels which had failed structural integrity tests and required repair or replacement by Rohr, including bonded panels in the new A+ model. Rohr prepared plans in 1990 for identifying availability of repair parts and options for making field repairs. The replacement bond panels came from current production and the production workers who installed the panels in the field came off the production line. (R4, tabs 338, 348)

The Government has emphasized that each of the panels had gone through Rohr's manufacturing process, including the cleaning process, and had been stamped off by the various departments in the assembly shop order planning documentation as having been

performed correctly. (The problem was that an extra, unauthorized cleaning had been performed.) (McNamara, tr. 3/114-15, 139-40) However, it has not suggested or pointed to testimony that DCAS-Santa Ana was aware of the delamination problem between April and 1 August 1989, and acted on that information in conducting its inspection activities. The evidence is to the contrary (tr. 3/140). The point it seeks to make, and one with which we would agree, is that errors in the planning documentation can reasonably be a cause for reasonable further inquiry by the inspectors in the performance of their quality inspections. (Tr. 3/108-11) This observation necessarily leads to an assessment of Rohr's responsibility for its own admitted errors in preparing the planning documentation – an area that Rohr has failed to assess.

Under the circumstances, assigning responsibility for Rohr's decision to shut down the bond shop to the Government would be unwarranted.

10. Imposition of Unreasonable Criteria for Paint Primer Inspection

Grumman's specifications required the application of a coat of paint primer to F-14 parts. Rohr applied the primer with a spray gun in the paint department during the F-14 manufacturing process. The paint protected the component from rust and atmospheric conditions during shipment. Grumman would later sand the components it received from Rohr, reprime and repaint them for final delivery to the Navy. (J. Wilson, tr. 3/191; Baker, tr. 11/176)

Under DCAS-San Diego the applicable Grumman specification required a minimum dry film thickness of 0.6 mils (.0006 inch) and an average maximum dry film thickness of 0.9 mils (.0009 inch). The specification also called for a minimum of three readings per square foot, taken at random, to determine primer thickness. Limited or inaccessible areas were not subject to the dry film thickness requirements. Instead, visual inspection was used to ensure complete coverage and the absence of excessive runs, sags and blisters. This specification was in effect from early in the program until 5 April 1989 when Grumman granted a specification deviation at Rohr's request.

Rohr used an "isoscope" to determine paint thickness. The isoscope measured the thickness of the paint through the use of a probe with a pencil-sized point. The isoscopes used by Rohr at the time did not generate a permanent record of the thickness measurements. The practice under DCAS-San Diego was to take six to ten readings. There was also an understanding in interpreting the specification that Grumman would be repainting primed parts. (McNamara, tr. 2/180-84; Thompson, tr. 10/239-41; J. Wilson, tr. 3/189-91; ex. A-170)

In contrast to DCAS-San Diego's practice of auditing the results, DCAS-Santa Ana requested notification of all Rohr inspections and inspected almost 100 percent of the parts for paint primer thickness in the paint shop It also re-inspected the paint during the final

physical inspection of the hardware, although the extent of this activity is not established. If a defect was found that could not be fixed on-the-spot, the assembly would have to be taken back to the paint shop for the repair. The process would take from 12 to 16 hours, while an on-the-spot repair would take approximately 2 hours. (McNamara, tr. 2/183-84; A. Perez, tr. 11/76-78, 83-85)

DCAS questioned Rohr's compliance with the paint specification. Both parties have focused on the December 1988 - January 1989 time frame as when the problem surfaced. On 5 December 1988, Grumman informed Rohr in SCAR 6827 that parts presented to Grumman failed to meet the paint and primer specifications for minimum and maximum thickness. Parts at both the Chula Vista and Riverside facilities were identified. The SCAR cited bonded panels from the Rohr Riverside facility that measured greater than the maximum paint thickness. Grumman noted that Rohr was also experiencing paint and primer problems with the inlet and glove assemblies. Two examples were cited: (1) DCAS had rejected A/C 584 L/H for failing to meet specification primer thickness, but had allowed Rohr to rework the primer prior to shipment; (2) for A/C 584 R/H, DCAS had rejected a panel for excessive white paint and the unit was shipped without the panel. Both units were shipped on 23 November 1988. Grumman asked for an explanation why Rohr's previous corrective actions for paint and primer problems were no longer effective and for what assurance Rohr would give Grumman that paint and primer problems would be permanently resolved. (R4, tab 162)

On 21 February 1989, Rohr Chula Vista submitted its formal response to Grumman SCAR 6827. It stated that the "root cause of the deficiency is due to possible differences in methods used to inspect primer/paint thickness." Rohr Chula Vista said it re-instructed all Rohr paint shop personnel and Rohr area inspectors on the Grumman specification requirements for F-14 primer and top coat. Area inspectors were also retrained in visual inspection requirements for complete coverage. Rohr Chula Vista advised that it would re-inspect all primed and painted parts in process for conformance to Grumman specifications prior to shipment. In addition, the area inspectors would begin performing random surveillance of all parts and test panels with paint or primer for thickness and would insure that the Rohr quality forms were employed, completed, and accurate. Finally, Rohr told Grumman that it had ordered a more accurate and reliable tester. Manufacturing personnel were to be re-qualified in the setup calibration and use of existing equipment and new equipment when it arrived. Rohr's Chula Vista's target date for completion of corrective action was 14 April 1989, readjusted from a target date of 5 June 1989. (R4, tab 162)

Rohr Riverside's response to the SCAR was dated 17 April 1989, after Grumman had granted the paint specification waiver, and took the same tack that Rohr Chula Vista's reply did. The response summarized Rohr's findings with respect to the problem and its proposed resolution, one of which was the specification waiver granted by Grumman. Part of the problem was the use of two isoscopes, which, though calibrated, could read at different levels of thickness. For example, one could read at .6 mils, while the other could possibly read .55 mils. Instances of inspectors' incorrectly including below minimum readings as a part of the

averaging were also reported. In addition to errors by Rohr employees, Rohr also found that DCAS and Grumman were taking readings in areas other than those initially measured by Rohr and obtaining different results. The solutions to the problems identified in the SCAR were new equipment, training, and the development of illustrated planning or "paint maps" to address the problem of reproducibility of test results by trying to assure that good representative samples were taken, and changes to the specification.

The SCAR itself was not addressed during the hearing; however, Mr. Robert W. Thompson, Rohr Riverside's Director of Engineering, testified on the development of the problem and how he dealt with it when it came to his attention in January 1989. His testimony was supplemented by Mr. Antonio Perez, Rohr Riverside's F-14 line operations manager from February 1989 through the claim period. We found their testimony persuasive and helpful to understanding the SCAR.

The Director of Engineering testified that it came to his attention in January of 1989 that DCAS-Santa Ana was using the isoscope to search for very small areas on parts that did not meet the specification requirements, including areas around fasteners and edges which were not subject to inspection. DCAS-Santa Ana also rejected parts because it was not able to repeat the isoscope measurements obtained by Rohr. DCAS was not examining the same areas as Rohr and was getting different results. He also recounted an incident as an example of DCAS's focus where DCAS-Santa Ana rejected a part for a thickness of .00057, when it should have been rounded to .0006 in accordance with established practice.

The request for specification relief referred to above was one of the steps taken by Rohr to address the problem. On 30 March 1989, Rohr informed Grumman that it could not reproducibly apply the primer coating to inlet and glove assemblies to meet minimum individual thickness requirement of 0.6 mils (.0006 inch), although it was meeting the average requirement of 0.6 to 0.9 mils. Rohr stated it was "meeting the intent of the specification requirements, but due to the current level of scrutiny of the hardware" deliveries to Grumman were being adversely impacted. Rohr requested a specification deviation to allow a lower individual minimum primer thickness reading of 0.3 mils, and maximum individual readings greater than 0.9 mils, while maintaining an average thickness requirement of 0.6 to 0.9 mils. Rohr also requested that the number of readings for parts greater in surface area than one square foot be changed from a minimum of three readings per square foot to a minimum of five readings made at random for the entire part. For parts with a surface area of less than one square foot in surface area, a minimum of three readings made at random would determine cost thickness. Rohr also proposed that rounding be in accordance with ASTM standards. Grumman approved Rohr's proposed deviation from specification requirements on 5 April 1989.

The Director of Engineering also testified that as part of the effort to alleviate DCAS-Santa Ana's concerns about repeatability and to provide objective evidence, Rohr ultimately purchased several isoscopes that printed out the paint thickness readings. Rohr

also developed illustrated planning for all components to regularize the paint inspection process. For example, the illustrated planning involved creating a 4 inch by 5 inch grid on a piece of paper identifying the areas on the part where the painter and inspector should take the readings and gaining DCAS approval. Under previous practice, there would normally be 40 to 50 readings on an entire inlet and glove. The new approach tripled the number of readings. When Rohr continued to get rejections, it further reduced the grid size.

Finally, Rohr conducted extensive training on the requirements of the paint specification and how to use the new isoscopes. The training included classroom instruction, hands-on training, and a final examination. (Thompson, tr. 10/217, 242-54; A. Perez, tr. 11/78, 79-84; exs. A-196, -198, -200, -265, -319, -425, -426)

From the time the specification deviation was granted on 5 April 1989 until July 1990 when the Operating Guidelines were adopted, there is no documentary evidence that DCAS-caused problems with measuring primer thickness continued. However, the inspection practices established by DCAS Santa-Ana and the measures necessary to accommodate DCAS's changed practices continued until the Operating Guidelines adjusted them. The guidelines provided that an isoscope would be used to determine primer thickness. Printouts were requested as objective evidence of Rohr's primer thickness readings. Paint maps depicting areas to be validated were to be available for inlet and glove and upper nacelle assemblies. Grumman and DCMC were to accept the isoscope printouts as objective evidence of specification compliance, with no other inspection required other than random sample inspections on a "non-interference" basis. The Director of Engineering acknowledged that the problem was resolved with the Operating Guidelines. (Thompson, tr. 10/249; ex. A-317 at R6066752).

Rohr itself was responsible for some of the problems; however, we also believe that DCAS constructively changed the practices in effect for inspecting the paint primer, subjecting the paint to closer scrutiny than was the previous practice and necessitating adjustments by Rohr to its practices in an effort to meet DCAS's concerns. In this connection, we understand, as the Government points out, that Rohr Chula Vista, which was not under the cognizance of DCAS-Santa Ana, also experienced the same problems. However, we see the change in inspection practices as stemming from the general direction of the DCASR-LA and are not surprised that DCAS-San Diego would aim to bring its practices in line with the shift in direction.

11. Removal of Members from Rohr's MRB

Both Grumman and the Government required Rohr's MRB engineers to submit their qualifications and experience for review and approval before they were allowed to serve on Rohr's MRB. (Guiles, tr. 7/63-65) Mr. Dunkel testified that in the first 18 years of the F-14 program, he did not encounter any difficulties with the qualifications of Rohr's MRB members. DCAS-San Diego never removed any of Rohr's members from the MRB. He

recalled only one instance in 1969 or 1970 where one individual was providing inadequate dispositions. The matter was brought to Rohr's attention and resolved by counseling and additional training without removing the individual. (Dunkel, tr. 5/31-33)

To qualify as an engineering member of Rohr's MRB, it was generally accepted that each person would have a college degree or equivalent. The person must have taken classes in strength of materials, stress dynamics, statistics, chemistry, and calculus, and must have at least six months of on-the-job MRB training. The qualifications were formalized into written operating instructions beginning in November 1989. Rohr's customers accepted these qualifications, and Rohr's MRB personnel satisfied these requirements during Rohr's performance of the F-14 program during the 1988-1990 time period. (Reed, tr. 8/67-70, 73, 74; exs. A-267, -274, -321, -349)

As we have found, DCAS changed the definition of major and minor nonconformance in April of 1988. Beginning in November 1988, DCAS-Santa Ana questioned the technical competence of certain Rohr MRB members. By QAR correspondence dated 9 November 1988, DCAS-Santa Ana objected to the continuation of Mr. Rudy Villasenor and Mr. Paul Ballow on Rohr's MRB on the ground that they had been unable to distinguish between a major and minor nonconformance on a withhold tag (ex. A-198; R4, tab 153). Mr. Villasenor, who had treated the questioned nonconformance as minor, was a senior engineer with nine years of MRB experience prior to this incident (ex. A-147). Neither Mr. Simpson, the DCAS-Santa Ana inspector who elevated the nonconformance to a major, nor Mr. Guiles, the DCAS-Santa Ana supervisor who authorized the DCAS action, had any communication with Mr. Ballow or Mr. Villasenor before forcing their removal from Rohr's MRB. (Guiles, tr. 7/98; Reed, tr. 8/75-80; ex. A-148)

After his removal Mr. Villasenor continued to work on F-14 withhold tags, but did not sign them. On 21 November 1988, DCAS objected to this practice and refused to consider tags with his handwriting. He was reassigned to commercial programs. He subsequently confronted and exchanged words with Mr. Simpson. Mr. Simpson was reviewing withhold tags and declined to continue in Mr. Villasenor's presence. In discussions with DCAS's Mr. Guiles, Mr. Reed, Rohr's MRB Engineering Manager, felt that a possible response to Mr. Villasenor's actions was the removal of Rohr's MRB authority. Rohr's engineering management subsequently apologized for the incident and discharged Mr. Villasenor, while expressing disagreement with DCAS's 9 November 1988 disposition. (R4, tabs 159, 163) Mr. Ballow was assigned to a different Rohr facility.

On 23 November 1988, DCAS-Santa Ana notified Rohr that it would no longer accept Mr. Danny Hernandez or Mr. Wayne Piascke as MRB members. No reasons were provided. DCAS-Santa Ana rescinded this action one week later. (Guiles, tr. 7/98-99; exs. A-155, -157)

On 10 April 1989, without any prior notice, DCAS-Santa Ana removed Mr. Aaron Potter as an MRB member. Mr. Potter was a senior Rohr MRB engineer, with 15 years of MRB experience at Rohr, NASA, and Rockwell. (Ex. A-294) DCAS said his engineering dispositions were "substandard" (ex. A-202). Mr. Reed testified that he did not consider Mr. Potter's MRB decisions to be substandard. Despite Mr. Reed's separate requests to Mr. Simpson and Mr. Guiles for the basis of DCAS-Santa Ana's decision, he was not provided an explanation. (Reed, tr. 8/80-82) However, Grumman's Mr. McNamara, agreed with the determination to remove Mr. Potter. In a Grumman review of 57 of Rohr's recommended dispositions of MRB actions, 23 percent of the dispositions were considered deficient in Grumman's eyes. Mr. Potter was considered responsible for more than half of the deficient dispositions. Mr. McNamara also considered the attitude he displayed with Grumman and DCAS personnel when approached on the subject unacceptable. (R4, tab 221; McNamara, tr. 3/60-62)

At the hearing, Mr. McNamara explained that because Mr. Potter had become frustrated by constant DCAS challenges to his engineering dispositions, Mr. Potter could no longer work effectively with the Grumman and DCAS personnel. (McNamara, tr. 3/128-29)

On 19 June 1989, DCAS-Santa Ana forced the removal of Mr. Harley Hauser and Mr. Frank Hernandez from Rohr's MRB because their dispositions had become "unacceptable" (ex. A-219). Mr. Hauser was a senior Rohr MRB engineer, with over 20 years of MRB experience at Rohr and McDonnell Douglas (ex. A-295). Mr. Hernandez had been a quality assurance member of Rohr's MRB Board for over 20 years (ex. A-287). Prior to the removal of Mr. Hauser and Mr. Hernandez, DCAS-Santa Ana had not advised Rohr that their MRB determinations were unacceptable. When Mr. Reed asked for details from DCAS-Santa Ana, Mr. Ed Samuelson, the DCAS representative who had issued the removal notice, referred to one withhold tag issued almost four months before the removal. The particular withhold tag, 77826C, involved a test failure of a production part which Messrs. Hauser and Hernandez characterized as a minor nonconformance. On 27 February 1989, Mr. Simpson of DCAS determined that the test failure was a major nonconformance which could not be processed locally. (Ex. A-223 at bates R6081971) The time lag between Mr. Simpson's determination in February and Mr. Samuelson's recommendation for removal action in June was likely caused by the elevation of the tag for processing at Grumman Bethpage and NAVPRO. Mr. Samuelson requested the removal as soon as it came to his attention on 19 June 1989. (Samuelson, tr. 21/23-24)

On 10 July 1989, Mr. Reed sent a letter to the DCAS-Santa Ana Branch Chief, Mr. John Hogencamp, complaining of DCAS-Santa Ana's removal of Mr. Hauser and Mr. Hernandez. Mr. Reed asserted that the actions of the DCAS-Santa Ana inspectors were unprofessional and adversarial, and should be reversed. The letter provided a detailed explanation of why "[n]o rules were violated, and hardware was not affected by the disposition." Mr. Guiles testified that he, as the resident DCAS supervisor, did not respond to

Mr. Reed's letter, and he did not recall if Mr. Hogencamp responded. There is no response in the record. (Guiles, tr. 7/99-102**;** Reed, tr. 8/82-84, 87-88; ex. A-223)

In August 1989, during the period of his removal, Mr. Hauser had an exchange with a Grumman MRB Engineer, for which he later apologized. Mr. McNamara of Grumman reviewed Mr. Hauser's relationship with Grumman and determined that his behavior and attitude were not appropriate for the Rohr F-14 MRB. By correspondence of 23 August 1989 to Rohr, Mr. McNamara advised that Mr. Hauser would not be considered for reinstatement to the MRB and requested that he be reassigned from the MRB area. Mr. McNamara took the actions because appropriate professional behavior by an MRB engineer was a "significant contributing factor in maintaining an acceptable interface and working relationship with both GASD and DCAS." (McNamara, tr. 3/62; R4, tab 297)

On 27 July 1989, DCAS-Santa Ana forced the removal of Mr. Jim Hunter and Mr. Vic Koktys from Rohr's MRB for an unacceptable disposition of a major nonconformance. Mr. Hunter had been a quality assurance member of Rohr's MRB for over ten years (ex. A-288). Mr. Koktys was Rohr's lead engineer, with over 20 years of experience (ex. A-290). On 26 July 1989 withhold tag 27865F was submitted to DCAS. On Item 1 Messrs. Hunters and Koktys identified a major nonconformance and indicated that a "use as is" disposition was appropriate. Rohr did not have authority to disposition major nonconformances and the tag should have been processed on a SMMR (ex. A-228; R4, tab 271). As Mr. Reed explained, Mr. Koktys had originally dispositioned the tag as a minor nonconformance. Upon review with Mr. Hunter, it was concluded that because of the location of the discrepancy on an air flow surface, the discrepancy was a major. When they added the word "major" on the disposition form, they failed to write "recommended" as to the disposition. (Reed, tr. 8/88-91)

Mr. Samuelson testified that as soon as one nonconformance on the tag was classified as a major, regardless of how many minor nonconformances may have been on the same tag, the tag had to be sent to Grumman and NAVPRO. The problem with the tag was not the omission of the word, "recommended," before the disposition, but the fact that it was presented to the MRB for local processing in the first place. He testified that a second reason for the removal of Messrs. Hunter and Koktys was that this tag was brought to the DCAS office at the time an audit team from the Los Angeles regional office was performing an audit on Rohr's MRB process. DCAS personnel from the audit team found the disposition so egregious, in the sense that the authors did not know the basic rules, that they recommended that the Rohr persons responsible for the determination not remain on the MRB. (Samuelson, tr. 21/25-26)

In July 1989, after DCAS-Santa Ana had removed many of Rohr's MRB personnel, Rohr was left with only two MRB engineers to process withhold tags on the F-14 program. (Reed, tr. 8/92) At the same time, the number of withhold tags on Rohr's military programs had increased dramatically due to the other changes imposed by DCAS-Santa Ana, making it

virtually impossible for Rohr to process withhold tags in a timely manner. Rohr could not hire new MRB personnel to handle the backlog, because six months of on-the-job training was required before new personnel could make MRB dispositions. DCAS-Santa Ana's actions had a severe impact on employee morale as Rohr's remaining MRB engineers were reluctant to work on military programs for fear of losing their jobs. (Reed, tr. 8/92-94) Of course, when DCAS-Santa Ana issued the Method C on 30 August 1989 all MRB activity ceased.

In July 1990, when Rohr regained its MRB authority under the Operating Guidelines, Rohr's MRB personnel, with the exception of Mr. Villasenor and Mr. Ballow, were reinstated to the MRB Board. As a prerequisite to readmittance to the MRB, DCAS-Santa Ana required each MRB engineer to take a refresher course in strength of materials and structures. (Reed, tr. 8/79, 80, 96-99; D. Wilson, tr. 14/239-41, 15/41, 42; exs. A-287-290, -294, -295, -317 at R6066744)

The Government contends that DCAS-Santa Ana acted reasonably and with justification in removing members of Rohr's MRB between November 1988 and July 1989. (Gov't br. at 13-15) We do not agree. We are persuaded that each of DCAS-Santa Ana's disagreements with Rohr's MRB members would have been handled informally by the DCAS-San Diego office, and would not have resulted in the removal of members from Rohr's MRB, certainly not without consultation. Mr. Reed testified persuasively that if the same types of disagreements with Rohr's MRB dispositions had occurred under DCAS-San Diego, they would have been resolved informally, without the removal of Rohr's MRB members. (Reed, tr. 8/87, 91) Mr. Guiles and Mr. Samuelson conceded that DCAS removed Rohr's MRB personnel without consulting anyone at Rohr, and provided no explanations for their treatment of the MRB members. (Guiles, tr. 7/97-101; Samuelson, tr. 21/59)

Against this background, the reaction of Grumman and Rohr management, taken in the interest of maintaining good relations with the Government, is understandable and we see Grumman's actions being driven in large measure by efforts to satisfy DCAS. Moreover, the reactions of three Rohr MRB members (Messrs. Potter, Hauser, Villasenor) following perceived harsh treatment from DCAS-Santa Ana cannot be used to say that their removal was justified. Under the circumstances, we consider DCAS Santa Ana's actions unreasonable and aimed at enforcing DCAS-Santa Ana's changes.

12. Rescission of Rohr's Standard Repair Manual

Under DCAS-San Diego Rohr frequently used the F-14 Standard Repair Manual to correct minor defects. The manual was an important element in Rohr's ability to respond immediately to a minor defect with an effective repair. Beginning in February 1988, Mr. Rumell refused to accept any MRB dispositions referencing a standard repair until Rohr could show evidence of prior Government approval of the standard repair. He also questioned canned "dispositions." (Baker, tr. 11/172-74; ex. A-73)

On 15 September 1988, Mr. David Guiles, DCAS-Santa Ana's SQAS at Rohr Riverside, approved a revised F-14 Standard Repair Manual. The manual in use under DCAS-San Diego contained "use as is" dispositions, in recognition of the possibility that repair or rework of a minor defect could cause more harm to the hardware than simply leaving it as was. Several months later, on 4 January 1989, Mr. Guiles, acting for DCAS-Santa Ana, partially rescinded Rohr's F-14 Standard Repair Manual for repairs containing "use as is" or "accept as is" dispositions. The rescinded repairs were the same procedures that had been approved by DCAS-San Diego in 1981 and by DCAS-Santa Ana in September 1988. This meant that items that could have been repaired under the manual now had to go through the MRB process, thereby increasing the processing time. (Guiles, tr. 7/105-07; ex. A-22 at 5, ex. A-171)

On 21 February 1989, Mr. Ed Samuelson, a product line specialist for DCAS-Santa Ana at Rohr Riverside, rescinded Rohr's F-14 Standard Repair Manual in its entirety, precluding Rohr's use of any standard repairs on the F-14 program. Rohr was advised that "the manual has been reviewed and found not to be acceptable in its entirety." DCAS-Santa Ana did not consult with either NAVPRO or DCAS-San Diego prior to rescinding the F-14 Standard Repair Manual. (Stip., ¶ 38; Guiles, tr. 7/108; Reed, tr. 8/51-53; Samuelson, tr. 21/61; ex. A-178) For parts on which standard repairs had been made between 4 January 1989 and 21 February 1989, DCAS-Santa Ana required Rohr to transfer the discrepancies and related repairs to withhold tags, and then elevate the withhold tags to Grumman on SMRRs as major nonconformances. (Reed, tr. 8/51-58; exs. A-408, -410, -418) This action was aimed at correcting an apparent misunderstanding stemming from the 4 January 1989 rescission of the "use as is" or "accept as is" repair. DCAS-Santa Ana representatives did not inform Rohr why the standard repairs were rescinded. The sections of the Standard Repair Manual containing the rescinded "use as is" standard repairs also contained other repair options that Rohr continued to employ. Confusion resulted between Rohr and DCAS-Santa Ana regarding the standard repair dispositions that Rohr could continue to use after the 4 January 1989 partial rescission. Although Rohr believed it was only barred from using "use as is" dispositions, Rohr later learned that DCAS-Santa Ana intended for all of the repairs listed in the 4 January 1989 correspondence to be rescinded, not just the "use as is" options. (Reed, tr. 8/51-53)

After the rescission of the F-14 Standard Repair Manual in February, Rohr Engineering immediately began rewriting the manual in an effort to satisfy DCAS-Santa Ana. Rohr submitted the first rewritten version, RPS 17.74, Rev. A, to Grumman on 29 March 1989. This version was not approved and Rohr Engineering prepared another version, RPS 17.74, Rev. B, dated 25 April 1989, and sent it to Grumman on 4 May 1989 for approval. With the exception of two repairs, Grumman and NAVPRO approved RPS 17.74, Rev. B on 16 June 1989. (Reed, tr. 8/58-61; exs. A-194, -204)

The Government has conceded that DCAS-Santa Ana's rescission of the F-14 Standard Repair Manual was a constructive change. (Gov't br. at 5) This concession was underscored by four Government witnesses, including two NAVAIR F-14 contracting officers, who all testified that DCAS-Santa Ana's rescission of the F-14 Standard Repair Manual constituted a change in practice that impacted Rohr. (Vandecar, tr. 5/170; Guiles, tr. 7/169; Blumenfeld, tr. 9/142, 160-61; Corning, tr. 9/184, 186, 199, 203, 209, 219-220, 10/10-11)

The Government starts the period of rescission on 21 February 1989. However, we measure the period of rescission from 4 January 1989 through 16 June 1989 since the partial rescission of the manual also represented a departure from established practice that impacted Rohr. Moreover, as a practical matter, the requirement that standard repairs affected between 4 January and 21 February be treated as major nonconformances and elevated to Grumman for review and approval had almost the same impact as a complete revocation on 4 January would have had.

The F-14 Standard Repair Manual was not used between 17 June 1989 and July 1990, when the Operating Guidelines went into effect. The manual was available for use between 17 June and 30 August 1989 and no persuasive reason why it was not used has been provided. However, once DCAA issued the Method C, revoking Rohr's MRB authority on 30 August 1989, Rohr had no authority to use its F-14 Standard Repair Manual while the Method C was in effect. For all practical purposes the Method C was in place until July 1990, when the Operating Guidelines became effective. (DCAS reinstated Rohr's MRB authority for the F-14 on 18 June 1990 and officially closed out the Method C by letter of 27 June 1990.) (Reed, tr. 8/62-63; D. Wilson, tr. 14/245; ex. A-317 at R6066750)

Prior to rescinding the F-14 Standard Repair Manual, DCAS-Santa Ana did not consider the likely cost impact of this action to Rohr. Revocation of the manual caused the number of withhold tags to increase and, as was the case with the change in the definition of major and minor nonconformances, caused the SMRRs to increase. In addition, Rohr was prevented from timely implementing simple, minor repairs. (Stip., ¶ 39; McNamara, tr. 3/132; Simpson, tr. 6/229; Guiles, tr. 7/107, 109; Reed, tr. 8/51; T. Perez, tr. 11/16-18; Baker, tr. 11/239)

It is conceded that when the F-14 Standard Repair Manual could not be used, the number of Rohr's withhold tags and SMRRs increased. (Gov't br. at 7) Rohr's Hammond study (*infra*, Rohr's Withhold Tag Study (The Hammond Study)) showed that of the 837 SMRR discrepancies that Rohr previously would have processed as standard repairs under the manual that was rescinded in its entirety on 21 February 1989, almost all of them occurred between 4 January 1989 and 19 July 1990. The discrepancies that were elevated after 19 July 1990 represented standard repairs that had been eliminated in the revised version of the manual. (Hammond, tr. 13/189-93; ex. A-442 at 10) The average delay per discrepancy for the 837 SMRR items that would have been processed as standard repairs was 14.9

calendar days. Previously, Rohr often initiated standard repairs within hours, or at most within a day or two after identification of the discrepancy. (J. Wilson, tr. 3/175-77)

13. Refusal to Allow Shipment of Parts While Corrective Action Pending

Resolution of a minor nonconformance at the MRB required both a recommended disposition and a cause investigation which led to a corrective action. The cause investigation and corrective action were required to assure that the same discrepancy or defect did not occur again (Samuelson, tr. 21/66). Rohr had 20 days to perform a cause and corrective action investigation and could request time extensions for completion.

The Government does not dispute and the record shows that DCAS-San Diego allowed Rohr to make repairs and deliver F-14 hardware to Grumman even though the corrective action indicated on withhold tags was pending. Shipment was not held up because the corrective action was intended for the future units to be manufactured. (Llinares, tr. 2/98-100; McNamara, tr. 2/175; Baker, tr. 11/162-63) The Government also acknowledges that DCAS-Santa Ana changed the practice and did not allow Rohr to ship F-14 hardware to Grumman with uncompleted cause and corrective action determinations. The timing of the change is at issue, however.

By QAR correspondence dated 7 March 1989, Mr. Ed Samuelson advised Mr. J. J. Perez, Quality Assurance Director at Rohr Riverside, that effective 1 June 1989, DCAS would not accept any hardware for shipment with open withhold tags. This meant the cause and corrective action determinations had to be completed. (Ex. A-187) Mr. Samuelson testified that he took this action because the number of withhold tags with delinquent cause and corrective actions had been escalating since October - November 1988 and repeated attempts to have Rohr do something about the delay had been unsuccessful. It was the "only way we could get their attention." The matter had been a concern since DCAS first became aware of the problem in the October - November 1988 time frame. He raised the matter with Grumman's Mr. McNamara many times, but was aware of no action taken by Grumman in response. (Samuelson, tr. 21/65-66, 87) Later, however, Mr. McNamara did comment on DCAS's actions in a 21 July 1989 communication to his superiors at Grumman Bethpage. He observed that:

> DCAS started to review all tag[s] when they realized how much hardware was still being shipped with old open MRR C/A functions. This is the only effective way DCAS has of controlling this. Note, Rohr almost impacted GASD's ability at CTO to DD-250 A/C 584 because of this open MRB function. GASD had to go to the president of Rohr to get this turned around.

(R4, tab 265 at 7)

On 7 March 1989, the same day Mr. Samuelson issued the QAR correspondence, he met with Mr. Perez to discuss the purpose of the letter and the backlog of delinquent cause and corrective actions. They agreed that whether a particular piece of hardware would be shipped with open delinquent tags would be determined on a case-by-case basis. This accommodation allowed hardware to be shipped and this issue was dealt with on a case-by-case basis thereafter. (Tr. 21/65, 69) No testimony was presented on the extent to which the case-by-case exception was used.

On 26 May 1989, Rohr sent a letter to Grumman requesting that it intervene, through NAVPRO, to resolve the issue of requiring all MRB tags to be completed for cause and corrective action prior to DCAS approval of shipments. This letter referenced a 16 May 1989 Rohr letter and the DCAS letter to Rohr written by Mr. Samuelson on 7 March 1989 and noted a 1 June 1989 effective date. (Ex. A-213)

The Government focuses on the 1 June 1989 effective date for the change. Rohr, on the other hand, maintains that the practice was in effect from approximately July 1988 until the Method C notice was issued on 30 August 1989. This position is based on an "estimate" by Mr. McNamara and generalized testimony by Mr. Llinares, who was Grumman's Director of Program Procurement during the claim period, which was not focused on the effective date of the DCAS action. (Llinares, tr. 2/9; McNamara, tr. 2/175-76) Mr. J. J. Perez did not testify on this point. We look to the written record and Mr. Samuelson's testimony as opposed to either Mr. McNamara's or Mr. Llinares's recall. Consequently, we conclude that the policy was in effect from 1 June 1989 until the Method C notice was issued in August 1989 and DCAS withdrew from participation. Prior to enforcing the new policy, DCAS-Santa Ana inspectors did not communicate with their own management or with Rohr regarding the potential cost and delay impact of their actions. (Guiles, tr. 7/116)

As Rohr points out "delinquent" cause and corrective actions were caused by the increase in MRB activity resulting from other DCAS-Santa Ana's changes. Moreover, with its MRB staff diminishing while the MRB workload increased, Rohr's cause and corrective action determinations fell behind schedule. However, Rohr's contention that the requirement made it impossible to maintain a predictable delivery schedule overstates the case. We are persuaded, as the Government argues, that not shipping an item, such as an inlet and glove, at the end of the production line did not affect Rohr's ability to continue work on the production line. The affected hardware would have been placed in a corner by itself and would not have backed up the hardware coming in behind it or had any effect on the rest of the production line. Rohr could project a delivery schedule to Grumman for the affected part by knowing where they were in the investigation. (Samuelson, tr. 21/71-72, 88) Finally, we are unable to identify any specific impacts to hardware during the period in question.

14. Elevation of Withhold Tags to Grumman and NAVPRO as Major Nonconformances

The Government has conceded that "more nonconformances were elevated to Grumman for review under DCAS-Santa Ana's cognizance." (Gov't br. at 8) Prior to the change in definition of major and minor nonconformances, Rohr processed approximately 100 withhold tags per month on the F-14 program, and very few of those were elevated to major nonconformances. (Reed, tr. 8/21) The number of SMRRs issued on the F-14 program increased from an average of 16 per calendar year in 1985-1987 to 53 in 1988, to 433 in 1989 and to 858 in 1990 (including 31 issued after the Operating Guidelines took effect). In 1991, 41 SMRRs were issued. (Ex. A-442 at 1)

Grumman's Mr. McNamara considered the change in definition of major and minor nonconformances to be one of the biggest problems encountered with DCAS-Santa Ana. Beginning in the August 1988 time frame (when the matter came to his attention) and increasing over time, Mr. Llinares believed that DCAS-Santa Ana actions were leading to the elevation of almost every Rohr F-14 withhold tag at Riverside as a major nonconformance. Grumman thought that DCAS-Santa Ana was refusing to take responsibility for the disposition of nonconforming material. In his view, it was "completely different from the way we had done business" and was a case of DCAS not taking responsibility. Because of the disruption, it was "very, very hard" for Rohr to provide Grumman with realistic schedules and it impacted Rohr's delivery of F-14 hardware. He was dismayed that DCAS-Santa Ana could not disposition withhold tags without elevating them on SMRRs, since Rohr's hardware "wasn't any worse . . . or better" than it had been during previous 18 years and Grumman agreed with Rohr's disposition on virtually every withhold tag. (McNamara, tr. 2/169-70; Llinares, tr. 2/92-97; ex. A-134)

In response to a request from Rohr in March 1989, Grumman provided assistance at Rohr Riverside by having a small team of its own MRB personnel from Bethpage, NY review withhold tags after they were dispositioned by Rohr MRB personnel, but before they were submitted to DCAS-Santa Ana. Mr. McNamara's purpose in this new Grumman involvement was to try to have the local DCAS-Santa Ana representatives gain confidence in the ability of Rohr's MRB members to review discrepancies, and to have DCAS-Santa Ana's inspectors complete the review of withhold tags locally, as they should have been doing. Because of the quantity of withhold tags that DCAS-Santa Ana was elevating to SMRRs and Grumman's subsequent treatment of the nonconformances as minor, Mr. McNamara concluded that either the DCAS-Santa Ana inspectors were not qualified to make MRB dispositions, or that DCAS-Santa Ana's ground rules were totally different from those established in Grumman's Letters of Delegation to Rohr. (McNamara, tr. 2/171-74; R4, tab 203)

The two NAVAIR F-14 contracting officers, who evaluated Rohr's claim, admitted that the increased number of SMRRs had an impact on Rohr. LCDR Corning also found that the change in practice had a "definite impact" on Rohr because a major nonconformance required

more paperwork than a minor nonconformance, and took longer to review and process. (Blumenfeld, tr. 9/133-36, 155; Corning, tr. 9/185-87, 200-01, 204; ex. A-350) Mr. Guiles also acknowledged that a withhold tag that is elevated unnecessarily to an SMRR could delay production and increase Rohr's costs. (Guiles, tr. 7/77-78)

Rohr tried to avoid creating major nonconformances because the processing time for SMRRs impacted Rohr's hardware flow time. (Baker, tr. 11/166) Rohr could not work on any parts with SMRRs until Grumman and NAVPRO approved Rohr's recommended engineering disposition. Mr. Baker testified that the agreement with Grumman in February 1990 that allowed Rohr to proceed "at risk" on hardware when an SMRR was pending did little to relieve the impact to Rohr's production line. He explained that Rohr performed a risk assessment of the cost of proceeding on each piece of hardware with a pending SMRR, but the unpredictability and inconsistency of DCAS-Santa Ana actions caused Rohr to decide in most cases that it could not accept the risk. (Baker, tr. 11/178-83; ex. A-293)

Rohr's inability to work on components until an SMRR had been dispositioned was addressed in the testimony of Mr. Reed, who was responsible for MRB functions at Rohr, and Mr. Baker. We find their testimony persuasive. Mr. Reed testified that they were not allowed to work on parts while a nonconformance anywhere on that part was being resolved. Both Mr. Simpson and Mr. Samuelson expressed the opinion to him that continuing to work on the parts was increasing the value of a nonconforming part, thereby putting undue pressure on both Grumman and NAVPRO to accept the part. (Tr. 8/21-24, 11/178-83) Mr. Guiles, who was the SQAS at Rohr Riverside from late August 1988 until November 1990, testified that Rohr could work at risk while a disposition was pending, but might have "to go back and maybe tear the whole thing apart," and do something else, or might even have to scrap the part. Moreover, if Rohr got to a point where they could no longer work around the deficiency, Rohr might have to stop production on the particular assembly. (Tr. 7/174-76, 206) His testimony was corroborated by Mr. Samuelson (tr. 21/26-28).

In the environment that Rohr was operating, a decision not to exercise a right to proceed "at risk" was understandable and reasonable. Even if we were to put to one side the testimony of Rohr's witnesses, the DCAS-Santa Ana representatives' testimony makes it clear that to proceed would have been imprudent. Moreover, if there had been no restriction on Rohr's ability to proceed with work while SMRRs were pending, as the Government suggests, there would have been no reason for Rohr to enter into an agreement with Grumman on 2 February 1990 allowing "at risk" work to go forward. Even after reaching the February agreement, Rohr, as we have found, decided in most cases that it could not proceed "at risk" because of the unpredictability of DCAS-Santa Ana's actions. We are not prepared to fault it for this approach.

The revocation of the standard repair manual, discussed above, and DCAS's withdrawal from participation in Rohr's MRB system also contributed to the increase in SMRR activity.

15. Withdrawal from Participation in Rohr's MRB System

On 30 August 1989, DCAS-Santa Ana issued a Method C notice to Rohr, refusing to participate in Rohr's MRB system because of alleged violations of MIL-STD-1520A. DCAS-Santa Ana cited an "extremely high level of nonconforming material" as the basis for the Method C notice. Putting to one side DCAS-Santa Ana's actions in increasing the MRB activity, the evidence shows that Rohr's MRB level was similar to other aerospace manufacturers employing older design technology. (Carter, tr. 1/153-55; Guiles, tr. 7/143; Reed, tr. 8/93-95; ex. A-256)

The immediate effect of the Method C notice was to require every Rohr F-14 deficiency to be processed on a SMRR form as a major nonconformance. Rohr MRB personnel were permitted to recommend dispositions on withhold tags and SMRRs, but the dispositions could not be implemented until they were approved by Grumman and NAVPRO. To expedite the review of withhold tags and SMRRs, Grumman augmented its team of MRB personnel at Rohr Riverside. Following Grumman's review of withhold tags and SMRRs, the SMRRs were forwarded to NAVPRO Bethpage for approval. The Grumman MRB team remained at Rohr Riverside until shortly after the Operating Guidelines became effective in July 1990. From 30 August 1989 through 17 June 1990, DCAS involvement was officially suspended. DCAS reinstated Rohr's MRB authority for the F-14 on 18 June 1990 and by letter dated 27 June 1990 finally closed out action on the Method C. (McNamara, tr. 3/19-24; Guiles, tr. 7/140, 144, 191; D. Wilson, tr. 14/246; exs. A-256, -286, -315, -316)

Rohr has also pointed to an earlier instance of DCAS-Santa Ana issuing a Method C and withdrawing from MRB activity. This occurred two days after the 24 January 1988 change in inspection responsibilities from DCAS-San Diego to DCAS-Santa Ana. On 26 January 1988, Mr. Rumell issued QDR No. 88-14, withdrawing all of Rohr's MRB privileges on military aircraft programs, without providing specifics. Rohr immediately notified Grumman that all manufacturing operations and shipments with pending MRB actions were stopped and asked for assistance. (J. Wilson, tr. 3/218-20; ex. A-63) The next day the suspension of Rohr's MRB authority was withdrawn and on 29 January 1988, Mr. Rumell issued QDR No. 88-15, which formally rescinded QDR No. 88-14.

However, QDR No. 88-15 also stated that Rohr's "MRB procedures as outlined in QADI 5.2.1 and 5.2.5 d[id] not meet the nonconforming material requirements of MIL-Q-9858A, para. 6.5." Rohr was told to provide "acceptable corrective action and milestones for the discrepancies noted" or else DCAS-Santa Ana would withhold MRB privileges. (J. Wilson, tr. 3/223-224; R4, tabs 76-78; ex. A-65) QDR No. 88-15 did not identify any specific deficiencies in Rohr's MRB system.

Mr. Rumell testified that Mr. Francis Prendergast of DCASR-LA and Mr. Ed Corrales of DCAS-Santa Ana ordered him to issue QDR No. 88-14 to Rohr. Mr. Rumell testified that the issuance of QDR No. 88-14 resulted from a heated internal discussion among

DCAS-Santa Ana representatives about shutting down Rohr's MRB system. He acknowledged that QDR No. 88-14 was "not a well written QDR because I didn't list the specifics." (Rumell, tr. 6/92-93)

As noted, QDR No. 88-15, like QDR No. 88-14, did not provide any details. Rohr had oral discussions with DCAS-Santa Ana representatives and Rohr attempted without success to get a list of specific deficiencies in writing. On 3 February 1988, Mr. Hall sent a letter to Mr. Rumell containing Rohr's response to what Rohr understood to be the Government's concerns. This letter referenced a meeting between Mr. Pat Vaughn of Rohr and Mr. Rumell in which Rohr had tried to learn what the specific deficiencies were. (Exs. A-66, -67)

On 5 February 1988, Mr. Rumell sent a QAR correspondence to Rohr stating that MRB privileges would be withheld at Rohr beginning 8 February 1988. This notice stated that Rohr's 3 February 1988 response to QDR No. 88-15 was not acceptable to the Government. The correspondence referenced "[d]efinitive descriptions of deficiencies" orally given on the evening of 26 January when QDR 88-14 was issued, during "five and one-half hours" on 28 January 1988 and again during a conversation with Mr. Hall on 4 February 1988 when he presented "unacceptable QDR 88-15 answers." (R4, tab 79, ex. A-70) Three days later, on 8 February 1988, Mr. Rumell sent a QAR correspondence to Rohr stating that the "withholding of MRB is being held in abeyance pending completion of satisfactory review of analysis." (Ex. A-71) During the time he was assigned to Rohr Riverside, Mr. Rumell never provided a written list of specific deficiencies to Rohr. (Rumell, tr. 6/112) As indicated, Rohr's MRB authority was not in fact withdrawn until 30 August 1989.

The Government concedes that DCAS-Santa Ana's 30 August 1989 Method C notice, refusing to participate in Rohr's MRB system, constituted a constructive change. (Gov't br. at 12) In his review of the F-14 claim, one of the contracting officers, LCDR Corning, observed that DCAS-Santa Ana's refusal to participate in Rohr's MRB system constituted a change in practice that "effectively killed" Rohr's MRB system. LCDR Corning further concluded that this change, requiring each discrepancy to be processed as an SMRR, was time-consuming and had a "definite impact" on Rohr. (Corning, tr. 9/191-94, 209; ex. A-337 at 17, ex. A-343 at 22, 29; ex. A-362)

According to Rohr's witnesses, as well as Grumman's Mr. McNamara, the impact of the Method C notice to Rohr's manufacturing line was significant. Rohr could no longer disposition nonconforming material on a timely basis through its normal MRB system. Parts shortages developed, as more work in process became backlogged in MRB, and Rohr was not allowed to work on hardware pending MRB disposition. Without an MRB system functioning as it had under DCAS-San Diego, Rohr was unable to develop a reliable schedule recovery plan, and flow time in manufacturing cost centers continued to increase. (McNamara, tr. 3/140; Carter, tr. 1/154; Baker, tr. 11/238, 12/225-27; Blank, tr. 13/45-51; ex. A-438 at 242, 247, 249, 254)

Government counsel argues that the impact of DCAS-Santa Ana's withdrawal was insignificant. It maintains that Rohr's MRB system actually functioned better during the period that the Method C notice was in effect. It asserts that the "average delay per discrepancy" was much less during this period than either the period before or after the Method C. (Gov't br. at 13) We are not persuaded that the impact was insignificant. The delay days per discrepancy may have been less during the Method C period, but the number of discrepancies treated as SMRRs was far greater. As Rohr points out, every withhold tag was elevated as a major nonconformance. The "average delay per discrepancy" was 9.4 days during the period 30 August 1989 through 1 July 1990, but there were 2,751 discrepancies treated on SMRRs during this period. (Ex. A-442 at 18) The volume of discrepancies, with every discrepancy requiring 9.4 days, was significant.

16. Issuance of Increased Number of Quality Deficiency Records

In accordance with DLAM 8200.1, a QDR, or Method B corrective action, was a written notice on a DD Form 1715 of a quality deficiency to which the contractor was required to respond in writing stating a corrective action for the described deficiency. QDRs would be issued when DCAS found deficiencies in procedure evaluations or procedure reviews and corrective action could not be performed on the spot, and when there were repetitive conditions that could not be resolved through Method A corrective actions. (Dunkel, tr. 5/9-10) QDRs were issued for hardware deficiencies, discrepancies in ASOs, or, in some circumstances, for lack of responsive corrective action when the proposed corrective action submitted was considered inadequate. (Simpson, tr. 6/184)

On 29 March 1989, DCAS-Santa Ana issued QDR 89-46A alleging that Rohr was one day late in responding to a previous QDR within the required seven days. Rohr responded that, under DCAS-San Diego, Rohr followed its M day calendar, which excluded weekends and holidays, to determine its response time to QDRs. Under an M day calendar, Rohr had two days remaining to respond to this QDR. Nevertheless, to accommodate the new position of the DCAS-Santa Ana inspectors, Rohr agreed to shorten its QDR response time and change its QDR tracking system to follow a calendar day schedule. (Simpson, tr. 6/185; J. Perez, tr. 9/88-92; ex. A-195)

The number of QDRs rose significantly after DCAS-Santa Ana assumed oversight of Rohr Riverside. This is demonstrated by the following before and after comparisons:

> In 1985, DCAS-San Diego issued a total of 44 QDRs. Eight QDRs related to the F-14 program; three QDRs related to all of Rohr's military programs; and 33 QDRs related to Rohr's other military aircraft programs.

> In 1986, DCAS-San Diego issued a total of 47 QDRs. Three QDRs related to the F-14 program; three QDRs related to all of Rohr's military programs; and 41 QDRs related to Rohr's other military aircraft programs.
>
> In 1987, DCAS-San Diego issued a total of 16 QDRs: none of the QDRs related to the F-14 program; one QDR related to all of Rohr's military programs; and 15 QDRs related to Rohr's other military aircraft programs
>
> In 1988, a total of 113 QDRs were issued: 32 QDRs related to the F-14 program; 11 QDRs related to all of Rohr's military programs; and 70 QDRs related to Rohr's other military aircraft programs.
>
> In 1989, DCAS-Santa Ana issued a total of 249 QDRs: 63 QDRs related to the F-14 program; 16 QDRs related to all of Rohr's military programs; and 170 QDRs related to Rohr's other military aircraft programs.

(Hammond, tr. 13/220-28; ex. A-441)

The Method A oral corrections also increased. The Method A log shows that 11 oral corrections were recorded in 1988. There were 127 recorded in 1989 and 59 in 1990. (Exs. A-393, -394)

Three DCAS-Santa Ana inspectors testified that the increase in QDRs issued at Rohr Riverside from 1987-1990 was the result of a change in practice between DCAS-San Diego and DCAS-Santa Ana. The change in practice encompassed QDRs for hardware discrepancies, planning documentation discrepancies, and unsatisfactory corrective action by Rohr. (Rumell, tr. 6/81, 82; Simpson, tr. 6/184-88, 192-193; Guiles, tr. 7/161) Mr. Blumenfeld, one of the NAVAIR contracting officers, admitted that the increase in QDRs constituted a change in practice. (Blumenfeld, tr. 9/138-40, 155; ex. A-350 at 130026)

After the Operating Guidelines went into effect in July 1990, the number of QDRs decreased sharply: In 1990, DCAS-Santa Ana issued a total of 62 QDRs. Eight QDRs related to the F-14 program; and 54 QDRs related to Rohr's other military aircraft programs. (Hammond, tr. 13/220-28; ex. A-441)

The increase in QDRs had a significant impact on Rohr. As more QDRs were received, Rohr had to dedicate greater resources to provide timely written corrective action. DCAS-Santa Ana typically did not grant time extensions to Rohr for responding to QDRs, even though it required Rohr to provide responses within seven calendar days instead of

seven M days. DCAS-Santa Ana often challenged Rohr's corrective action. In those instances when a QDR affected hardware, Rohr was not allowed to ship the hardware before its response to the QDR was accepted. (Luksza, tr. 10/163-66)

Rohr and Grumman Actions in Response to DCAS-Santa Ana's Changes

Development of Rohr's Claim

On 17 February 1988, 24 days after the change in cognizance, Rohr's Director of Program Management, issued an internal directive to Rohr to collect "disruption costs resulting from DCAS' refusal to approve [MRB] tags processed in accordance with previously approved procedures." (R4, tab 81) This directive went to Rohr senior management (Baker, tr. 12/191-93; Hall, tr. 5/61). However, as discussed *infra*, Rohr found that it was not possible to track direct labor costs in this manner, and the cost charging system was not used (Carter, tr. 2/13-14).

On 11 March 1988, six weeks after the change in cognizance, Rohr's Vice President, Program and Contracts, provided Grumman a notice of change. The letter complained about the impact caused by DCAS and asked for a meeting to "review the impact to the F-14 Program resulting from the DCASMA constraints." (R4, tab 85) This led to a meeting with Grumman and NAVPRO personnel at Rohr on 5-6 April at which Rohr explained "the impact of the disruption and what the disruption was." (Llinares, tr. 2/84; ex. A-110)

By letter dated 25 April 1988, Mr. Llinares, Director of Program Procurement, responded to Rohr's letter of 11 March 1988. Mr. Llinares suggested that the April meeting had eliminated the need for the change notice. He advised, however, that if a claim was intended, there was no basis for lodging it against Grumman since Grumman could not be held responsible for DCAS's actions. (R4, tab 101)

By letter of 14 July 1988, Rohr's Vice President, Commercial Business, formally advised Grumman that under the terms of the purchase orders for Lots 18 and 19, Rohr was entitled to an equitable adjustment in both contract price and delivery. Rohr advised that it looked to Grumman since the Government was acting as its inspection agent; however, Rohr indicated a willingness to proceed against the Government, if Grumman were prepared to sponsor its appeal. The letter further stated that:

> Rohr expects that Grumman will take reasonable steps, as required by the terms of its prime contract with the Government, to protect Rohr's right to appeal to the appropriate board or court. Preserving and facilitating Rohr's right to that appeal would permit Rohr to resolve its dispute with the Government with minimum involvement, cost or risk on the part of Grumman. In the event that Grumman, by its action or inaction, were to

> prevent Rohr from expeditiously resolving its claim against the Government through the normal Government dispute resolution channels, Rohr would be required to rely on a more traditional dispute resolution process for commercial transaction[s]. Since Rohr's contract is with Grumman, that traditional process would require Rohr's action be brought against Grumman based on its responsibility for both its own actions and those of its agent.
>
> After you have reviewed this issue in light of the facts and circumstances of this particular claim, Rohr believes that you will conclude that it would be to the advantage of Rohr, Grumman, and the Government for Grumman to facilitate Rohr's right to pursue an indirect appeal against the Government in connection with this matter.

(R4, tab 119)

By letter dated 9 August 1988, Grumman notified the NAVAIR contracting officer of Rohr's notice of change (R4, tab 126). The contracting officer, in turn, notified DCASR-LA of Rohr's "intention to file a claim for cost and schedule relief" and asked for a review and response by 20 September 1988, while noting that the allegations may be without legal merit (R4, tab 135). The Director of Quality for DCASR-LA responded on 19 September 1988, rejecting the allegations (R4, tab 135).

By letter dated 22 August 1988, eight months into the claim period, Rohr informed Grumman that it "understands Grumman's need to understand the how, where and when of the DCAS actions which impacted production cost and schedule. Rohr is currently in the process of preparing a claim which will detail those actions and establish the basis of Rohr's entitlement to an adjustment in contract price and delivery schedule." The letter included a legal analysis dealing with the sponsorship of subcontractor claims against the Government and the propriety of a prime contractor certifying a claim with which it did not wholly agree. The letter promised that:

> . . . Rohr will provide Grumman with full support for its claim. Rohr will, of course, certify that claim as required by the Contract Disputes Act and after reviewing the merits of that claim we expect that regardless of the standard applied, Grumman would be able to provide its certification in good faith.

Rohr's letter concluded with the advice that since its delay was excusable and because it was entitled to an adjustment in the delivery schedule, it was not responsible to Grumman for alleged production line impact costs. In addition, Rohr rejected the suggestion that it absorb the DCAS disruption costs, commenting that it had done so in the past when it could have

"supported a claim," but declined to do so now "in light of the magnitude of the cost and schedule impact." (R4, tab 130)

In September 1988, Rohr's general counsel engaged present counsel for three basic purposes: first, to analyze what was happening on the F-14 program, although Rohr knew there were problems with DCAS and Grumman; second, to assess responsibility for the cost growth among Rohr, Grumman, and DCAS; and, third, to help the company prepare proposals to recover any costs that might be recoverable under its subcontract with Grumman. Counsel, in turn, hired the consulting firm of Booz-Allen & Hamilton to serve as its investigative arm and to help analyze Rohr's production effort, with Rohr's approval. (Fuener, tr. 15/97-103, 107-10; Lewis, tr. 16/158-59)

Rohr made two submissions to Grumman: a Proposal Support Document (PSD) dated 8 March 1989, and a Request for Equitable Adjustment (REA) dated 28 June 1989, both of which were prepared principally by counsel, with the assistance of the consultants. The PSD and REA submissions addressed Grumman's responsibility for late and defective engineering associated with the F-14A+ model change, as well as the DCAS-Santa Ana changes. (Fuener, tr. 15/102, 218-20; R4, tab 318, ref. c; R4, tab 381) Counsel and the consultants also prepared the subsequent certified claim that Grumman submitted on Rohr's behalf to the Navy, along with its own claim.

The principal purpose of the PSD was to support Rohr's proposal in the negotiation of Lots 20 and 21. The PSD identified a number of Grumman or DCAS actions which undermined the assumptions made when Grumman and Rohr agreed to the not-to-exceed $2.3 million per shipset price in the 1985 MOU. The following actions were identified: accurate and complete F-14A+ engineering drawings were late; restart of the Riverside production line was extended 3-1/2 months (plus an additional one-month extension not attributable to Grumman or DCAS); restart of production of Lot 18 was inefficient over the initial 3-1/2 months, effectively causing an additional loss of 2 months in schedule performance; and DCAS inspectors and Grumman quality personnel deviated significantly from the inspection and quality practices established over the long history of the program.

Insofar as Lot 18 was concerned, the PSD observed that Rohr's planned 18 months for major assembly was compressed by approximately 4-1/2 months due to (1) significant delays in getting tooling refurbished and remastered; (2) the problems with late Grumman-supplied engineering. An additional two month compression was encountered but was not clearly attributable to Grumman or DCAS changes. The total compression required Rohr to add approximately 55 new workers (beyond the core of 26 workers) to the F-14 program at Riverside on the inlet and glove production line in an attempt to maintain schedule. The added workers were not experienced in working on the F-14 program and their presence alone accounted for a significant work hour increase over the MOU baseline level of inlet major assembly hours. (R4, tab 381 (PSD at 84))

In the PSD the total recurring cost growth for Lots 20 and 21 was estimated to exceed the MOU baseline by $13.5 million, of which $5.6 million was assigned to DCAS. Grumman was assigned $3.4 million. (The effect of the late start attributable only to Grumman actions was estimated at 659 hours per shipset for Lot 20 and 206 hours per shipset for on Lot 21. Rohr assumed $4.5 million in costs. Rohr sought a price of $2,736,000 (including 15 percent profit) per shipset for Lot 20 and $2,729,000 (including 15 percent profit) for Lot 21.

The PSD itself makes clear that Grumman-caused problems were continuing as of March 1989. In the introductory section of the PSD, at page 7, Rohr states that:

> . . . [P]roduction labor hours and service labor hours have increased dramatically due to inefficiencies resulting from these interrelated changes to the MOU Baseline and also due to configuration changes made after the signing of the MOU. Rohr's material costs have also increased as a result of the bill of material changes. These increased costs have carried through to subsequent lots.

By letter dated 28 June 1989, Rohr submitted the REA to Grumman. There were subsequent discussions and in September 1989, six months after the PSD was prepared, and in the first month following DCAS-Santa Ana's withdrawal from participation in Rohr's MRB, matters came to a head. Rohr was recovering from the Bond Shop shutdown (1 August - 29 August 1989). Its deliveries were significantly behind schedule, and its schedule slippage was threatening Grumman's F-14 aircraft delivery dates to the Navy. Rohr's cost overruns had become such a burden that some relief from Grumman was essential.

Grumman and Rohr met on 27 and 28 September 1989 to discuss the issues. By letter dated 29 September 1989 to Grumman, Rohr's President & Chief Operating Officer (CEO), Mr. Robert H. Goldsmith, summarized the various impacts that Rohr was experiencing on Lots 18 through 21 and estimated cost overruns of over $80 million. The letter also expressed Rohr's view of who bore responsibility for the additional costs. The letter states, in pertinent part, as follows:

> . . . Rohr has incurred cost increases of $38.6 million on Lots 18 and 19 and expects to incur an additional $29.9 million in cost increases on Lots 20 and 21. Rohr believes approximately one-third of this is due to Grumman actions and one-third is due to DCAS actions, and is willing to absorb the remainder of these costs.
>
> In addition, recent events . . . may increase costs on Lots 20 and 21 by an additional $11.7 million, of which we expect one-third

> is DCAS responsibility and two-thirds is Grumman responsibility.
>
> . . . .
>
> F-14 production Lots 20 through 23 (GFY '88-'91) are currently released to manufacture, with approximately one-half of Lot 20 being delivered to and accepted by both Grumman and the Government. Rohr's current costs to produce this hardware are more than 70% above the $2.3 million N.T.E. price limit recognized by Grumman. This follows the pattern shown in previous lots, but the situation is becoming more difficult. Changes to Rohr's work scope, directed by both Grumman and the Government, have contributed to sharply increased levels of Rohr's costs as follows:
>
> > 33% in Lots 18 and 19 (completed)
> > 41% for initial units of Lot 20 (completed)
> > 71% projected for completion of Lots 20 and 21 (including the recent additional approximately $11 million)
> >
> > . . . .
>
> The attached Appendix A lays out all of the Rohr costs, by lot and identifies the roughly one-third-each which we believe is the legally and equitably correct allocation of responsibility.

(R4, tab 318)

In Appendix A, for each Lot up to the date of the letter, Rohr assigned the following costs to DCAS: Lot 18 (18 aircraft) - $2,468,000; Lot 19 (15 aircraft) - $5,401,000; Lot 20 (12 aircraft) - $9,545,000; Lot 21 (12 aircraft) - $11,773,000. The total attributed to DCAS was $29,187,000 or 36 percent of the $80,290,000 overrun. The amounts assigned Grumman for each Lot were: Lot 18 - $10,368,000; Lot 19 - $6,238,000; Lot 20 - $4,589,000; Lot 21 - $7,677,000. The total amount assigned as Grumman responsibility was $28,872,000. Rohr proposed to absorb $22,231,000: Lot 18 - $8,240,000; Lot 19 - $5,934,000; Lot 20 - $4,097,000; and Lot 21 - $3,960,000. (DCAS was assigned $25,289,000 in costs prior to the date of the letter.)

The 29 September 1989 letter was reviewed by counsel before it was sent to Grumman (Fuener, tr. 16/13-14). There was testimony aimed at minimizing the importance of the letter, particularly the assessment of DCAS-Santa Ana responsibility for Lots 20 and

21. It was said that Mr. Goldsmith submitted this letter as a way to prod Grumman into meaningful discussions and the letter achieved its objective since Rohr and Grumman subsequently settled the matters between them. It was also suggested that the references to the DCAS-Santa Ana changes were included in the letter, as well as in prior Rohr submittals to Grumman, because Rohr was a subcontractor to Grumman and lacked privity of contract with the Government. (Carter, tr. 2/42; D. Wilson, tr. 14/224-28; Fuener, tr. 15/109-10)

Mr. Goldsmith did not testify, so we do not have the benefit of his explanation. We see no reason to treat the letter as anything other than a reasoned assessment by Rohr's top executive. The letter was prepared and submitted after a thorough examination, led by counsel, into the causes of Rohr's performance problems. Though the letter may have served to prod Grumman, this goal is not at odds with a truthful corporate assessment on Rohr's part.

After settlement discussions, Mr. Goldsmith and a Grumman Vice President, Mr. Peterson, reached an understanding on the basic terms of an agreement, and then a team from Rohr and Grumman convened to create a formal document. (D. Wilson, tr. 14/228-29) On 19 October 1989, Rohr and Grumman entered into a formal settlement agreement. The agreement contained a series of delivery incentives covering the last four aircraft of Lot 20 and all of the deliveries called for under Lot 21. Under the agreement, Rohr would receive total potential payments of $13.5 million, subject to a reduction of $50,000 per aircraft if the delivery incentives were not met. Rohr actually received $12.7 million under this agreement because it was unable to achieve any of the delivery incentives. (D. Wilson, tr. 14/230-31; ex. A-264 at ¶ 3)

The formal agreement contained a mutual release of certain claims and a reservation of others. Excepted from the release were: "Claims and REAs by Rohr in the nature of constructive change or other claims alleging that acts or omissions of the Government have impacted Rohr production effort." Grumman agreed to sponsor Rohr efforts "to process such claims and REAs to the Government." Grumman was to complete its evaluation within six months of its receipt of Rohr's CDA certification of "that claim or REA" and, if appropriate, submit it to the Government. (D. Wilson, tr. 14/233-34; ex. A-264 at ¶ 6b)

Rohr's Revised Pricing for Lots 22 and 23

Resolution of Rohr's issues with Grumman also led to revised pricing for Lots 22 and 23. In the Lot 22 and 23 negotiations with Grumman and the Navy, Rohr maintained that it could no longer perform its F-14 subcontracts at $2.3 million per shipset. Rohr asserted that the price and schedule should change as a result of DCAS-Santa Ana's changed inspection and acceptance practices at Rohr's facilities. (Johnson, tr. 1/76-77) Grumman and the Navy ultimately approved a price of $3,995,556 per shipset for the Rohr components in Lots 22 and 23. (Johnson, tr. 1/77; ex. A-445, at 2)

The NAVAIR Program Office cited the DCAS inspection issue as part of the justification for the price increase to Rohr. NAVAIR's Business Clearance Memorandum, which was dated 23 May 1990 and approved on 29 June 1990, acknowledged that the 23 July 1985 MOU contained a ceiling price of $2.3 million per shipset, but stated that "major concessions were . . . required by the Government in order to settle the ROHR requirements." The memorandum observed that during the fact finding for the pre-negotiation clearance for FY 90, NAVAIR began to recognize that "something was dramatically wrong" at Rohr. It offered the following summary.

> ROHR is experiencing an overrun of such magnitude that they are contemplating abandoning the military aircraft business completely. The NAVAIR position in the pre was to address the problem by escalating the $2,300,000 per s/s in FY 86 by 5% a year through FY 90. It soon became apparent that major concessions were going to be required by the Government in order to settle the ROHR requirements. The PCO along with other Government representatives visited ROHR in March 1990 to factfind on what was driving ROHR's costs so dramatically. ROHR was extremely paranoid over the role of the DCAS as an inspector. ROHR had filed a claim for adjustment of the FY 86, 87, 88, and 89 purchase orders with GAC. This claim, which has not been processed to the Government, projects the impact to ROHR of performance on the F-14 aircraft purchase orders as follows:

Responsibility	FY 86	FY 87	FY 88	FY 89	TOTAL
DCAS (1)	$2,468	$5,401	$9,545	$11,773	$29,187
GAC (2)	10,368	6,238	4,589	7,677	28,872
ROHR (3)	8,240	5,934	4,097	3,960	22,231
	$21,076	$17,573	$18,231	$23,410	$80,290

> (1) changes in inspection standards and process book audit
> (2) late engineering, additional inspection requirements, process book audit
> (3) ROHR inefficiencies

> ROHR became so disturbed with the DCAS last summer that it stopped delivering nacelles and inlet/glove to GAC until some resolution was reached on the inspection issue. DCAS and ROHR do not communicate except in a very hostile manner. GAC did reach agreement with ROHR to resume deliveries on the FY 88 contract with the arrangement to take on the Material

> Review Board in conjunction with the NAVPRO and to pay $13,500,999 to ROHR as consideration for the GAC-induced changes. ROHR has dropped the request for $28,872,000 compensation from GAC but has not dropped their request for compensation for alleged constructive changes made by the DCAS.

From the Government's perspective, the Rohr "problem was one of the most difficult and complex issues to resolve during the negotiation." (Ex. A-311 at 16-19)

Rohr performed Lots 22 and 23 on schedule, and realized a profit of approximately 15 percent. (D. Wilson, tr. 14/251-52)

The Operating Guidelines

Rohr's management would not agree to an F-14 price or schedule for Lots 22 and 23 until it obtained a resolution of its problems with DCAS's operations at Rohr's facilities. The adoption of operating guidelines for DCAS inspection activities was the solution ultimately agreed to by all parties. (Johnson, tr. 1/68-72; Carter, tr. 1/16-67; ex. A-304; R4, tab 355)

The Operating Guidelines are a series of documents that went into effect on 2 July 1990. (Ex. A-317) They consist, *inter alia*, of: (1) a 5 June 1990 redelegation of MRB authority from Grumman to Rohr, endorsed by NAVPRO; (2) a 7 June 1990 request for Government Contract Quality Assurance from NAVPRO to DCAS-Santa Ana, with procedures on how DCAS inspection and acceptance should be performed; (3) a 4 June 1990 F-14 Operating Guidelines agreed to by Rohr and Grumman, which were attached to the NAVPRO Request for Government Quality Assurance issued to DCAS; (4) a revised Grumman Quality Assurance Plan for Grumman Supplier Control Representatives at Rohr Industries; (5) a 19 June 1990 DCAS-Santa Ana QAR correspondence to Rohr reinstituting MRB activity at Rohr facilities as of 18 June; and (6) a 15 June 1990 DCAS-San Diego QAR correspondence to Rohr indicating that DCAS would implement the same Operating Guidelines procedures at Rohr's Chula Vista facilities. (D. Wilson, tr. 14/238-51; ex. A-317)

One of the key features of the Operating Guidelines was a new procedure for DCAS review of Rohr's withhold tags and ASOs. DCAS agreed to review these items on a "post-audit basis." After implementation of the guidelines, the DCAS rejections of Rohr hardware and documentation declined dramatically. (Johnson, tr. 1/78; Llinares, tr. 2/109; McNamara, tr. 3/17-18; D. Wilson, tr. 14/242-44, 251-52)

Rohr's Claim

On 27 February 1991, Grumman and Rohr submitted a certified claim to the Navy's contracting officer that forms the basis of this appeal (Stip., ¶ 42). The claim was transmitted by letter dated 26 February 1991. The letter recites that "[i]n accordance with FAR, Subpart 33.2, Disputes and Appeals, and as further defined under FAR 52.233-1 and Alternate I of the subject contracts," Grumman was submitting a total request for equitable upward adjustment of $48,224,568. (Ex. A-322) Rohr's own claim was certified and submitted to Grumman on 11 January 1991 (R4, tab 5). In a subsequent letter dated 21 April 1992, Grumman advised the contracting officer that its 26 February 1991 letter was intended "to constitute a claim within the meaning of the CDA and the FAR 52.233-1 Disputes clause." (R4 tab 376) In response to this letter, the contracting officer by letter dated 7 May 1992 advised Grumman that the Navy had not rejected Rohr's claim.

The Government's Review and Analysis of Rohr's Claim

Following the submittal of Rohr's claim to the contracting officer, DCAS-Santa Ana prepared a 31 July 1991 report in rebuttal to Rohr's claim. (Ex. A-338) The DCAS-Santa Ana report opposes Rohr's claim in all respects, and recommends that the claim be denied. The DCAS-Santa Ana report was included in DPRO-Grumman's Technical Analysis Report (TAR) containing the Government's official position in response to Rohr's claim. (Blumenfeld, tr. 9/148, 68; Corning, tr. 9/198)

The DCAS-Santa Ana report does not dispute that there was a change in practice between DCAS-San Diego and DCAS-Santa Ana. It specifically recognizes a number of the changes in practice addressed above such as the number of withhold tags elevated as major nonconformances, the definition of a repetitive discrepancy, and rescission of Rohr's Standard Repair Manual.

On 21 January 1992, the DPRO-Grumman submitted its TAR to NAVAIR. The TAR incorporated the DCAS-Santa Ana report. DPRO-Grumman prepared its own narrative report in rebuttal to the allegations of Rohr and Grumman. The TAR also recommended that the claims of Rohr and Grumman be denied in their entirety. (Ex. A-343) The DPRO-Grumman report tacitly admits that the DCAS-Santa Ana office did, in fact, employ different inspection and acceptance practices than DCAS-San Diego. The report provides:

a. DCAS-Santa Ana applied a different interpretation of "repetitive discrepancy" than DCAS-San Diego. (Ex.. A-343 at 14, 24)

b. DCAS-Santa Ana had a different interpretation of major and minor nonconformance than DCAS-San Diego did. (*Id*., at 15-22)

c. DCAS-Santa Ana's revocation of Rohr's Standard Repair Manual constituted a change in practice. (*Id*., at 25)

Mr. Andrew Blumenfeld was assigned as NAVAIR contracting officer to review the F-14 claim in January 1992. Mr. Blumenfeld was the responsible contracting officer for the claim from January 1992 until he left NAVAIR in early 1993. During that time, he possessed an unlimited contracting officer's warrant. (Blumenfeld, tr. 9/114-21; ex. A-342, entry for 1/21/92) Mr. Blumenfeld reviewed the Grumman/Rohr claim, as well as the DPRO-Grumman TAR and its enclosures. Mr. Blumenfeld also conducted fact finding meetings with Grumman and Rohr, and he held internal fact finding meetings with Government employees. In response to his requests for additional information, Grumman and Rohr submitted, in his word, "reams" of additional documentation. He held one week-long meeting in California with at least 50 DCAS, NAVPRO and other Government personnel. The purpose of this meeting was to allow the DCAS-Santa Ana representatives to explain their position on Rohr's claim in further detail, and to engage in a discussion about the merits of the claim. (Blumenfeld, tr. 9/122-28)

Based upon his review of the DCAS-Santa Ana report and his discussions with Government and contractor representatives, Mr. Blumenfeld concluded that there had been a change in inspection practices after the DCAS change in cognizance, and that Grumman and Rohr had made a strong enough showing of entitlement to move forward to the issue of quantum. In particular, Mr. Blumenfeld concluded that changes had occurred in the areas of: (1) DCAS-Santa Ana's elevation of substantially more minor nonconformances to major nonconformances; (2) DCAS-Santa Ana's issuance of a greater number of QDRs to Rohr; (3) DCAS-Santa Ana's rescission of Rohr's Standard Repair Manual; and (4) DCAS-Santa Ana's change in the definition of "repetitive discrepancy." (Blumenfeld, tr. 9/128-28, 133-44, 146; exs. A-353, -354)

In September or October 1992, Mr. Blumenfeld prepared a draft report to his NAVAIR supervisor. This document contains a section titled "Flawed Technical Analysis Report," which is critical of the DCAS-Santa Ana report and the DPRO-Grumman TAR. This section of Mr. Blumenfeld's report states as follows:

> The technical analysis performed by DCMAO and reiterated by DPRO Grumman in a corollary report contains dozens of express admissions that a change in inspection and acceptance procedures took place and would severely prejudice the Government's ability to successfully litigate this matter. The TAR fails to comprehend the central kernel of Rohr's claim; that the underlying multiyear subcontract was priced on the not unreasonable presumption that the inspection practices of the first 18 years of the F-14 program would continue and they were not. Rohr's point is not that their inlet and nacelle products were

> perfect, they acknowledge that they were not, but rather that they reasonably relied on the quality assurance practices and specification interpretations that held sway during [the] first 18 production lots and that DCMAO's departure from those agreed-to practices represents a compensable change to the contract. DCMAO's response to an allegation of change is to proffer their interpretation of the relevant specifications as a defense to the allegations in the claim. The point is not that Santa Ana's specification interpretations were less reasonable than their predecessors but rather that they were different from the presumptions used to establish the subcontract price. The TAR presumes that the specification requirements are absolute and are wholly unaffected by the prior interpretations which is clearly wrong. Worse, MIL-STD-1520, the specification used by Santa Ana to defend many of their actions is only invoked in one of the four affected F-14 contracts.

Mr. Blumenfeld further stated in this document that he had ". . . little desire for additional information." (Ex. A-352 at 2-3) He explained at the hearing that this statement referred to his conclusion that Rohr had gotten over the entitlement hurdle, and that additional information regarding entitlement was not necessary. (Blumenfeld, tr. 9/167-70) The claim was unresolved when Mr. Blumenfeld left NAVAIR in early 1993. (Blumenfeld, tr. 9/121)

In February 1993, LCDR Michael Corning succeeded Mr. Blumenfeld as NAVAIR contracting officer for the F-14 claim. LCDR Corning received an unlimited contracting officer's warrant in March 1993. In beginning his work on the claim, LCDR Corning conducted an independent review. He examined approximately 20 volumes of information that Grumman and Rohr had submitted previously, and the DPRO-Grumman TAR with its enclosures. LCDR Corning also attended a briefing with Grumman and Rohr to obtain a synopsis of their overall position. LCDR Corning later attended approximately six other briefings with Grumman and Rohr, and he conducted several internal Government meetings with DCAS-Santa Ana, DCAS-San Diego, the Defense Contract Audit Agency (DCAA) San Diego Office, and DPRO Grumman. (Corning, tr. 9/175-81)

Like his predecessor, Mr. Blumenfeld, LCDR Corning came to the conclusion that Rohr had made a strong showing of entitlement, and that the Government should move in the direction of quantum (Corning, tr. 9/211). In particular, LCDR Corning determined that DCAS-Santa Ana had changed the inspection and acceptance practices at Rohr Riverside in the following areas: (1) the definition of a "repetitive discrepancy;" (2) the rescission of Rohr's Standard Repair Manual; (3) the interpretation of major and minor nonconformances; (4) the withdrawal from participation in Rohr's MRB system; (5) the change from the PVI method of inspection to the POPE method; and (6) the elevation of withhold tags as major

nonconformances for Grumman and NAVPRO review. (Corning, tr. 9/182-84, 186, 189-91, 195-96, 200-04)

LCDR Corning remained the NAVAIR contracting officer responsible for the Grumman/Rohr claim until June 1994 (Corning, tr. 10/12). On 4 February 1994 Grumman and Rohr filed an appeal with the Board on the basis of a "deemed denial" (41 U.S.C. § 605(c)(5)) because of the contracting officer's failure to issue a final decision (R4, tab 388). LCDR Corning subsequently issued a final decision on 28 February 1994. The decision denied the claim in its entirety. While acknowledging the "apparent validity of some entitlement issues," the contracting officer observed that the "inability to address causality issues, linking entitlement to . . . specific allegations with specific identifiable damages has resulted in this decision." (R4, tab 389)

DECISION ON ENTITLEMENT

To obtain an equitable adjustment, Rohr must establish three elements by a preponderance of the evidence: liability, causation, and resultant injury. *See, e.g., Wilner v. United States*, 24 F.3d 1397, 1401 (Fed. Cir. 1994) (*en banc*); *Servidone Constr. Corp. v. United States*, 931 F.2d 860, 861 (Fed. Cir. 1991). These elements are familiar and not disputed by the parties. The adequacy of Rohr's proof is very much in issue, however.

Initially, we note that Rohr's argument for recovery is narrow and focused. Rohr's counsel has emphasized that its case is "based simply on changes in contract interpretation between DCAS[-]San Diego and DCAS[-]Santa Ana." It does not concern whether DCAS-San Diego or DCAS-Santa Ana was "more correct or more reasonable in the inspection and acceptance practices used" or "whether Rohr's quality system or quality performance was good or bad." The "real issue" is whether the practices changed. Counsel urges that none of DCAS's actions was taken in response to any perceived poor performance or deficiencies in Rohr's performance. Instead, the actions were taken because DCAS-San Diego was considered "too lenient" in its interpretations and practices. (Tr. 1/20-24; app. br. 188-200) In Rohr's view, it reasonably relied on the quality assurance practices and specification interpretations that had been established during the 18 years of F-14 production preceding DCAS-Santa Ana's assumption of quality assurance responsibility, and the departure from those agreed to practices and procedures represents a compensable change to the contract.

Rohr relies principally on our decision in *Gary Aircraft Corp.*, ASBCA No. 21731, 91-3 BCA ¶ 24,122, and on *Gresham & Company v. United States*, 470 F.2d 542 (Ct. Cl. 1972). As we explained in *Gary*, where the Government imposes a change in the inspection system which exceeds the contract requirements as written and practiced, the Government becomes responsible for the added costs of the resulting disruption, citing *Lumen, Inc.*, ASBCA No. 8364, 1964 BCA ¶ 4436 (Government substantially increased records requirements). In assessing the "contract requirements as written and practiced," we also recognized the potential applicability of the *Gresham* principle that "a contract requirement

for the benefit of a party becomes dead if that party knowingly fails to exact its performance, over such an extended period, that the other party reasonably believes the requirement to be dead." 470 F.2d at 554. *See also King-Hunter, Inc.*, ASBCA No. 22376, 78-2 BCA ¶ 13,426 (*Gresham* principles applicable to sponsored subcontractor appeals).

We think that Rohr's reliance on the principles spelled out in *Gary* is appropriate and we agree that some of the parallels between Rohr's situation and Gary Aircraft's are noteworthy. *Gary* involved an aircraft engine overhaul repair contract awarded in January of 1971. The overall quality and reliability of the repaired engine had steadily increased from the time of award through August 1974, and Gary's quality control was considered adequate. In the words of one Government witness, "they were doing all right." Though performance was not flawless, the quality problems were "not of such import as to prevent significant satisfactory production." Gary's quality control system and production were of sufficient quality to merit a favorable pre-award survey for a follow-on contract. DCAS had an on-site team ranging from 6 to 12 persons at Gary Aircraft's plant to inspect production and quality control. A policy of cooperation and procedural informality was in effect.

During the first part of August 1974 the established inspection practices changed dramatically. The change in practice grew out of a U.S. General Accounting Office (GAO) study questioning Gary's property control procedures under its Air Force contracts. GAO found that Air Force and DCAS surveillance had been inadequate and recommended adequate surveillance in the future. The GAO study did not involve or criticize Gary's quality assurance system. Reacting to the GAO criticism, the Air Force and DCAS decided to "tighten the screws" to insure proper accountability for Government property. The Government established a team to assist Gary in straightening out its Government property control system. Upon arrival the team expanded its charter to include the area of quality and quickly grew to about 50 members. One of the Government's top team members testified that he believed "things had slid for some time" and that "now [was] the time to make the contractor comply with the Quality portion of the contract." He testified that the mission was to get the contractor in compliance with the contract quality requirements "or shut the plant down."

Agreed procedures were abruptly altered. DCAS had previously allowed a certain number of minor discrepancies and would still accept the item involved. Minor defects were no longer allowed; strict compliance was required. For example, Gary was required to record certain dimensions in its work books. It was DCAS's practice to judge the work book acceptable (and thereby the engine) if there was a "SAI" (satisfactory as is) entry by a Gary employee. This method had been jointly developed by the parties during production and was considered a satisfactory way of indicating that a particular engine dimension was acceptable. The team rejected this approach and insisted that the exact measurement be entered in the work book.

In another case, contract technical orders provided that a certain number of copper-bronze particles present in the chip tray during engine testing was indicative of a problem requiring removal of the engine for corrective action. When particles were found, DCAS's previous practice was to permit a "penalty run," regardless of the number of particles, to see if the problem cleared up. If the problem cleared up during the penalty run, the engines would be approved. The Government stopped the penalty run procedure and would reject any engine which exceeded the technical order criterion for particles. The change in practice increased the number of engines rejected and reduced production.

Precision in paper work, which had not been a problem before, became a matter of great concern. A previously agreed system of documenting contract compliance was abruptly changed. DCAS's previous practice of allowing a certain number of minor discrepancies and still accepting the product was rejected by the team. The team wanted to have "full compliance" and "to go strictly by the book." Moreover, the new inspectors were not intimately familiar with the engines and the new team was offering technical order interpretations at odds with interpretations made by Gary and Air Force personnel years ago. Ultimately, Gary was required to rewrite all of its work instructions and most of its quality control procedures. Previously, needed revisions had been accomplished on an "informal and mutually agreeable basis."

The team "cut off all verbal and informal" communication between Gary and DCAS. Over the course of the contract the parties had handled minor problems through the Method A oral correction process. Any problem or discrepancy no matter how minor was to be given "the 'Method B' or 'Method C' treatment," and required the preparation of a QDR. Gary could no longer utilize the informal method of working out problems. The QDRs increased dramatically.

The changes culminated in a complete shut down of Gary's plant on 29 August 1974 and a claim that between 12 August and 1 September, Government inspection activity totally disrupted Gary's effort and resulted in a "nearly complete loss of productive effort in the plant." Ruling on entitlement only, we concluded that during the period in question the Government exceeded its right to reasonable inspection and caused disruption in Gary's production to its financial detriment.

We reach the same conclusion here. There certainly are parallels between the *Gary* case and Rohr's situation and in some respects Rohr's situation may be more compelling. Rohr had a more substantial record than Gary. For the first 18 years of the F-14 program, Rohr produced acceptable hardware, and its quality assurance program functioned as intended. The F-14 program received a normal level of attention from Rohr management. Grumman performed annual audits of Rohr's quality compliance. An April 1987 process audit found that Rohr was in full compliance with all process specifications (bonding, plating, and painting) and in a quality system audit in January 1988, just before the formal transfer, Rohr received a satisfactory rating. In addition, in JPC or joint prime contractor audits of

Rohr in January of 1989 and June of 1990, Rohr received satisfactory ratings. For that matter, Rohr produced acceptable F-14 hardware throughout the program, both prior to and after the 24 January 1988 change in cognizance to DCAS-Santa Ana.

Similarly, the initial focus was not on Rohr's quality. The parties have stipulated in this respect that the decision to transfer inspection responsibility to DCAS-Santa Ana was based on the logistics of trying to monitor a plant two hours away from San Diego the transfer of responsibility to DCAS-Santa Ana was not due to any perceived quality assurance deficiencies at Rohr's Riverside facility.

However, the emphasis shifted. DCAS-Santa Ana Section Chief's August 1987 fact finding trip led to the conclusion that DCAS was understaffed at the facility, not performing as it should, and that a "talented and aggressive" SQAS was needed. Although it might be said that the principal focus was on DCAS itself, not Rohr, a change in DCAS's approach would necessarily have potential consequences for Rohr. Mr. Rumell's mission was to change the way business was done by DCAS at Rohr. He was there to provide the "aggressive leadership" that the DCAS-Santa Ana Section Chief felt was necessary. Once there, he indicated that after DCAS-Santa Ana took over responsibility, he would "shut Rohr down," if it did not get its MRB activity down to what he considered an acceptable level.

By noting this parallel to *Gary* we do not intend to overestimate Mr. Rumell's influence. He was reassigned in March of 1988. In our view, he was acting on behalf of DCASR-LA and the course of action that he helped set in motion continued and, as we have found, other changes in established inspection practices were made after his departure. Moreover, we see his threats, as well as his subsequent one-day withdrawal from participation in Rohr's MRB, in the context of underscoring DCAS's seriousness in changing the quality assurance practices that had been followed under DCAS-San Diego's regime.

Our findings and conclusions are confined to determining, as we have, that the contract requirements as written and practiced were in fact exceeded and to assessing the impact of the changes on Rohr. In this context we see no need to do an exhaustive comparison of the various changes made here with those in *Gary* as Rohr has done in its brief.

One of the more visible results of DCAS-Santa Ana's activities was the significant increase in the number of QDRs issued once it took over responsibilities from DCAS-San Diego. In 1985, 1986 and 1987, a total of 107 QDRs were written, of which 11 were written on the F-14 program. In 1988, a total of 113 QDRs were written, of which 32 QDRs related to the F-14 program. In 1989, the total number of QDRs issued by DCAS-Santa Ana jumped to a total of 249, of which 63 QDRs related to the F-14 program. After the Operating Guidelines went into effect on 2 July 1990, the number of QDRs decreased sharply. In 1990, DCAS-Santa Ana issued a total of 62 QDRs. Eight QDRs related to the F-14 program.

In this area the Government does see a distinction — the only one it advances — between this case and *Gary*. The Government points out that in *Gary* the new Government inspection team "cut off all verbal and informal contact" and "insisted that all problems be handled formally in writing." 91-3 BCA at 120,716. While acknowledging that DCAS-Santa Ana communicated often through written Method B QDRs, the Government points out that DCAS-Santa Ana also continued to issue frequent Method A oral corrections. This distinction is not a material one. At most this argument says that the situation could have been worse – more QDRs could have been issued. In the context of *Gary*, the important fact about the Method A activity here is that not only did it continue, but the level of that activity *also* increased significantly, due principally to questions concerning Rohr's planning documentation. The increased levels of *both* Method A and Method B activity evidence DCAS's changes to the established inspection practices.

From the standpoint of marking the beginning of the changes to existing inspection practices, we have looked to 5 January 1988, rather than the official 24 January 1988 transfer date or the arrival of Mr. Rumell in October 1987. On 5 January 1988 the inspection method was changed from PVI to POPE. Standing alone, a change from PVI to POPE might be expected to ease the impact of Government inspection on the contractor. Here, however, it had the opposite effect when coupled with DCAS-Santa Ana's other actions. The Government has quite properly conceded[2] that the change from the PVI method to the POPE method was a constructive change. Mr. Rumell certainly made his presence known from the moment of his arrival; however, the record suggests that while DCAS-San Diego was in charge, the effect of his actions was softened, if not eliminated, by Mr. Dunkel and the oversight of DCAS-San Diego. The shift in focus to a greater process orientation, coupled with his initial lack of aerospace experience and lack of sympathy for the MRB process at Rohr, allowed Mr. Rumell greater freedom of action. Moreover, the initial lack of product experience of some DCAS-Santa Ana inspectors would be more easily accommodated when the inspection process focused more on the paperwork, than on the product, but may have contributed to hyper-technical objections to the paperwork.

DCAS-Santa Ana's practice with respect to servicing Rohr's MRB cribs and approach to providing weekend and overtime coverage reflects the changed attitude, a shift to a more regularized, by-the-book approach. Once Mr. Rumell departed, we could not say that DCAS-Santa Ana's practice was less responsive than its predecessor during normal working hours; however, there was less willingness to support overtime requests and the previous informal practice of dealing with overtime requests was dropped in favor of a more formal approach. Seen in isolation the impacts of these changes in approach may well be *de minimis*, as the Government has observed. However, they are symptomatic of the systematic changes in quality assurance practices and procedures and we consider them only in assessing the overall impact of DCAS-Santa Ana's actions.

The cancellation of the P-Note system in February 1988 was also a change to existing practice. The cancellation immediately increased the level of Rohr's MRB activity, and

brought with it inefficiency and delay because each part being built to the informally released engineering had to be processed on a withhold tag through the MRB system. In addition, Grumman developed a plan to clear the outstanding P-Notes. Rohr also had to track and prioritize the formal engineering change orders through the Grumman approval process.

Similarly, the change in the definition of repetitive discrepancy had consequences for Rohr in its performance of Lots 19, 20 (which the Government has acknowledged) and (which we found). This change in practice resulted in increased findings of repetitive discrepancies for common nonconformances. This in turn caused an increase in the quantity of Rohr's withhold tags and the number of required corrective action and root cause determinations. Rohr was required to assign additional manpower to its Corrective Action Board to perform the increased quantity of cause and corrective action analyses.

Dropping the P-Note system and demanding change of the definition of repetitive discrepancy in February 1988 was followed in April 1988 with the change in the definition of major and minor nonconformances. This change meant that all MRB actions which exceeded the parameters of standard repair procedures would be considered Type I major nonconformances. Throughout 1988 and 1989, Rohr attempted to resolve its disagreement with DCAS-Santa Ana on the definition of major and minor nonconformances. The issue was not resolved until December 1989 when DCAS-Santa Ana agreed that the definition of major and minor nonconformances employed by DCAS-San Diego and Rohr prior to the change in cognizance was correct. However, nonconformances categorized as "process discrepancies" continued to be treated as major until the Operating Guidelines were implemented in July 1990.

The change in the definition of major and minor nonconformances had a significant impact. It eliminated Rohr's MRB authority to disposition minor nonconformances, and required all nonconformances to be processed on SMRRs and referred to Grumman and NAVPRO for resolution. This change was a major contributor to the increase in the number of withhold tags elevated to Grumman and NAVPRO as SMRRs.

Prior to the changes in definition of major and minor nonconformances, Rohr processed approximately 100 withhold tags per month on the F-14 program, and very few of those were elevated to major nonconformances. After the change in definition, the number of major nonconformances on the F-14 program, as reflected in SMRRs increased from an average of 16 per calendar year in 1985-1987 to 53 in 1988, to 433 in 1989 and to 858 in 1990 (of which 31 were issued after the Operating Guidelines took effect).

Another major contributor to the increase in withhold tags and SMRR activity was the partial and then total rescission of Rohr's F-14 Standard Repair Manual in January and February of 1989 — also an admitted constructive change. The manual was an important element in Rohr's ability to respond immediately to a minor defect with an effective repair. Its unavailability until June of 1989 and subsequent unavailability for all practical purposes

from 30 August 1989 until July 1990 caused the number of withhold tags and SMRRs to increase. Rohr was prevented from timely implementing simple, minor repairs.

Rohr's Hammond study showed that of the 837 SMRR discrepancies that Rohr previously would have processed as standard repairs under the manual, almost all occurred between 4 January 1989 and 19 June 1990. The discrepancies that were elevated after 19 June 1990 represented standard repairs that had been eliminated in the revised version of the manual. (Hammond, tr. 13/189-93; ex. A-442 at 10) The average delay per discrepancy for these 837 items was 14.9 calendar days.

Rohr's MRB process was further taxed by DCAS-Santa Ana's removal of many of Rohr's MRB members. The removals began in November of 1988. Over time the removals impaired Rohr's ability to timely process withhold tags. Ultimately, Rohr was left with only two MRB engineers in July 1989 to process withhold tags on the F-14 program. At the same time, the number of withhold tags had increased dramatically due to the other changes imposed by DCAS-Santa Ana.

DCAS-Santa Ana's decision in June 1989 to require MRB tags to be completed for cause and corrective action before authorizing shipment further compounded the burdens placed on Rohr. Of course, when DCAS issued the Method C on 30 August 1989 and withdrew from participation in Rohr's MRB, it effectively shut down Rohr's MRB system. The immediate effect was require to require every Rohr F-14 deficiency to be processed on an SMRR form as a major nonconformance. Rohr MRB personnel were permitted to recommend dispositions on withhold tags and SMRRs, but the dispositions could not be implemented until they were approved by Grumman and NAVPRO. The volume of SMRRs was significant: 2,788 discrepancies were treated as SMRRs from 30 August 1989 through 1 July 1990 with an "average delay per discrepancy" of 9.4 calendar days.

DCAS-Santa Ana's focus on Rohr's paperwork was also an integral part of the changed inspection practices. DCAS-Santa Ana interpreted "objective evidence" to require significantly more detail in the ASOs than had been the prior practice. It had an inspect to reject approach in the review of Rohr's planning and in the words of a Grumman representative was "punitive." This focus is also reflected in DCAS-Santa Ana's changed criteria for paint primer inspection, subjecting the paint to closer scrutiny than had been the previous practice. It is also evident in DCAS-Santa Ana's October 1988 change in the method of examining Rohr's ASOs in the final inspection process.

Rohr was required to rewrite its planning. Between 1988 and 1990 Rohr either created or revised many supplemental records to meet DCAS-Santa Ana's objective evidence requirements. The thickness of the ASO package grew from 9 inches in February 1988 to 15 inches under DCAS-Santa Ana in April 1989, and to 19-1/4 inches in February 1990. In addition, DCAS-Santa Ana's review of the ASOs took one to three days and on occasion longer, in contrast to the several hours under DCAS-San Diego. (Guiles, tr. 7/135, 189)

In summary, quite apart from the Government's concessions, our own findings have convinced us that DCAS systematically changed the way it approached quality assurance at Rohr during the claim period. We are further convinced that those changes unreasonably disrupted and increased Rohr's costs of performance. At the same time it is clear that Rohr encountered problems of its own and with Grumman for which the Government is not responsible and for which DCAS-Santa Ana could legitimately raise questions. For example, Rohr's difficulties in satisfying DCAS-Santa Ana's inquiries for objective evidence were compounded by Rohr's own internal problems: inadequate discipline in employee data entry and inadequate training of employees — to name two. Rohr also contributed to some of the problems associated with the paint primer specification.

We turn now to an assessment of the parties' responsibility for quantum.

QUANTUM DETERMINATIONS

Introduction

Rohr seeks $34,050,632 in damages based on claimed costs of $27,377,790, plus an average General & Administrative (G&A) rate of 6.1 percent ($1,676,510), an average Cost Accounting Standards (CAS) 414 cost of money (COM) rate of 2.2 percent on claimed costs ($638,187), and a profit of 15 percent ($4,358,145). With respect to Rohr's costs, the hours incurred on Lots 18 through 21 and the various labor and overhead rates are no longer in dispute.[3] The elements of Rohr's claimed costs of $27,377,790, less a $1 rounding difference, are summarized below (exs. A-550, -551; tr. 16/122,125).

Production Labor Hours	
Major Assembly	$6,413,447
Common Shops	
Fabrication	$2,605,602
Subassembly	$1,257,328
Adhesive Bond Labor	$713,996
Total Production Labor	$10,990,373
Direct Services Labor	$7,017,333
Allocated Services Labor	$2,353,838
Special Teams	
Planning Audit	$371,901
Planning Rewrite	$947,785
Process Compliance	$389,101

Process Impact	$576,993
Throughput Improvement	$201,101
Total Special Teams	$2,486,881
Total Labor & Overhead	$22,848,425
Materials	
Freight	$376,813
Scrap	$319,137
Ti Fasteners	$63,798
Binstock	$734,675
Total Materials	$1,494,423
Additional Wheel Well Costs	$44,848
Claim Preparation Costs	$2,990,093
Total Labor, Overhead, Material	$27,377,789

Overall Reasonableness of Rohr's claim

Before we turn to an evaluation of Rohr's evidence, several comments on the parties' contentions concerning the overall reasonableness of Rohr's claim when viewed as a percentage of the cost overrun are in order. From Rohr's perspective its overall claim is conservatively priced and reasonable. Of the total cost overrun of $70,168,251, Rohr claims $29,054,300 or 41.4 percent of the cost overrun. (Ex. A-550) The unclaimed portion of the overrun is acknowledged to be attributable either to Grumman or Rohr causes unrelated to the DCAS-Santa Ana changes, or to DCAS-Santa Ana impacts which Rohr excluded from the claim because the evidence would not meet Rohr's strict requirements for inclusion. (Johnson, tr. 1/83-84) Rohr also maintains that its claim of $34,050,632 is equivalent to an increase of $597,380 per aircraft ($34,050,632 divided by the 57 aircraft in Lots 18 through 21 for which Rohr produced components). If the 18 aircraft produced in Lot 18 are excluded from this calculation, the increase is $873,093 per aircraft ($34,050,632 divided by 39 aircraft). Adding the $873,093 increase to the $2.3 million price per aircraft which governed Rohr's prices for Lots 18 through 21, the adjusted price is $3,173,093 per aircraft. Rohr says that if its claim is granted in the full amount requested, the adjusted price per aircraft is still $822,461 less than the FY 1990 price of $3,995,556 accepted by NAVAIR for Lots 22 and 23. (Ex. A-311 at 16-19)

In the Government's view, Rohr's assertion that the Government bears only 41.4 percent of the total recurring cost overrun on Lots 18 through 21 is misleading. Under the Government's analysis, Rohr has assigned the Government a significantly greater portion of the overrun for Lots 19 through 21. The Government emphasizes that Lot 18 was essentially complete when the change in cognizance occurred, with Rohr in a serious loss position and delinquent in deliveries. (Ex. G-136; Hubbard, tr. 19/151-52; Johnson, tr. 1/99) Rohr's overrun on the Lot 18 contract at that time was $13 million, a 29 percent overrun. (Corning,

tr. 10/12-14; R4, tab 389) It also says much of the work on Lot 19 was complete before DCAS-Santa Ana assumed inspection cognizance, particularly in FC 11 Fabrication and FC 16 Subassembly. (Ex. G-136; Hubbard, tr. 20/24-26, 53-54) If Lot 18 is excluded from the calculations, the Government bears approximately 64.6 percent of the overrun for Lots 19 through 21. Moreover, for Lots 20 and 21, the only lots performed exclusively under the inspection authority of DCAS Santa Ana, the Government's claimed responsibility rises to 76.2 percent of the overrun, leaving Rohr with a 23.8 percent share of the overrun. (Gov't br. at 82, 100, 137; R4, tab 6 at 250)

From Rohr's perspective, the percentages are not surprising, but are in line with its view of the evidence of record. It is quite logical that the DCAS-Santa Ana portion of the overrun would progressively increase in Lots 19 through 21, because the effects of the six-month production shutdown before the start of Lot 18, and the defective engineering from Grumman had diminished and eventually disappeared in later lots. (Fuener, tr. 15/124)

The Government has also pointed to what it considers inconsistencies in Rohr's position in September 1989 as expressed by its President and CEO and Rohr's present position. Rohr's President and CEO's letter of 29 September 1989 did suggest a gross allocation of responsibility for its overruns on Lots 18 through 21, then projected at about $80.2 million. At the time of the letter, Rohr accepted one-third of the responsibility for $68.5 million of the projected overrun for itself, while assigning one-third each to Grumman and DCAS. The letter also noted the possibility that "recent events . . . may increase costs" on Lots 20 and 21 by an additional $11.7 million. Rohr assigned none of the additional costs to itself. Instead, Mr. Goldsmith suggested that Grumman was responsible for two-thirds of the costs, while DCAS was responsible for the remaining one-third.

The Government argues that the assignment of responsibility in the letter is inconsistent with Rohr's position that Grumman-caused problems had basically ended with Lot 19. It says that even if it were true that the letter was sent as a way to prod Grumman into meaningful discussions, as Rohr now contends (app. br. at 99), it does not adequately explain the inconsistency.

However, the evidence presented at hearing is more consistent with a diminished role for Grumman in Lots 20 and 21 — a role aimed at seeing that Rohr satisfied DCAS's requirements — and DCAS's increased responsibility for additional costs, than with the assignment of responsibility suggested in the President and CEO's earlier letter. We rely on the evidence presented at the hearing. Whether Rohr overstated Grumman's responsibility for the potential additional costs Rohr expected to incur in Lots 20 and 21 as a negotiating ploy, we need not and do not decide. Even if Rohr may have used the letter to prod Grumman, we see no reason to ignore the letter altogether, particularly the admissions that Rohr's own problems contributed to the cost overruns and those problems were expected to continue during the performance of the lots at issue here.

In any event, Rohr has presented a pricing methodology that does not depend upon the assignment of percentages of the overall cost overrun to the respective parties for validation. Our analysis focuses on the specific evidence presented in support of the various claim elements. Our quantum award is based on our judgment as to the adequacy of Rohr's specific proof, albeit with some adjustments we have deemed appropriate in order to make a fair and reasonable approximation of Rohr's damages.

Decision on Rohr's Method of Pricing the Major Assembly, Common Shops, Services Labor and Special Teams Claim Elements

Rohr has used a modified total cost methodology to arrive at the major assembly, common shops and services labor elements of its claim. As indicated, the parties have agreed on the labor hours incurred, as well as the direct and indirect rates. Moreover, the Government has conceded the reasonableness of the incurred costs (Gov't br. at 80). At this point agreement ends and the parties begin to part company.

The Government has argued that to prevail on a modified total cost basis, a contractor must prove (1) the impracticability of proving its actual losses directly; (2) the reasonableness of its bid; (3) the reasonableness of its costs; and (4) its lack of responsibility for the added costs, citing *Servidone Constr. Corp. v United States*, 931 F.2d 860, 861 (Fed. Cir. 1991). (Gov't br. at 80) The elements identified by the Government more properly refer to the elements necessary to support a "total cost" claim and we would amend the statement of the second element to include an assessment of the reasonableness of the bid *or* estimate, as the case may be. *See WRB Corp. v. United States*, 183 Ct. Cl. 409, 426 (1968)). Nevertheless, as a practical matter adjustments or modifications are made in most cases where the total cost method is successfully employed to insure the reasonableness of the award. In *Servidone,* the Federal Circuit reviewed a modified total cost determination by the Claims Court that did not rely on the contractor's bid price. The bid price was considered unrealistic. As an alternative, the court reviewed the evidence and made its own assessment of what would have been a reasonable bid and proceeded on that basis. It also considered the extent to which the contractor was responsible for additional costs. The Federal Circuit affirmed the court observing, quoting *Boyajian v. United States*, 423 F.2d 1231, 1240 (Ct. Cl. 1970), that the total cost method was used:

> "only as a starting point" with such adjustments thereafter made in such computations as allowances for various factors as to convince the court that the ultimate, reduced, figure fairly represented the increased costs the contractor directly suffered from the particular action of defendant which was the subject of the complaint.

931 F.2d at 862.

As the Government points out the total cost method is to be used with "caution and only as a last resort" because its application can "skew" an accurate computation of damages. For example, bidding inaccuracies can reduce a contractor's estimated costs, while performance inefficiencies can inflate the contractor's costs. *Servidone*, 931 F.2d at 861-62. A "modified" total cost methodology, however, seeks to allay some of the concerns with the total cost method by making appropriate adjustments to the claim to account for the inaccuracies and inefficiencies. And, if it is impracticable to prove actual losses directly, there is no impediment to an award on the basis of a properly modified total cost claim.

Moreover, Rohr's modified total cost methodology has not attempted to justify the reasonableness of its lot prices, although it has questioned the validity of the Government's own analysis of Rohr's pricing, or to propose adjustments to its prices in order to establish its damages. The only use that Rohr has made of the purchase price for Lots 18 through 21 is to measure the magnitude of Rohr's total cost overrun. Instead, Rohr has relied on a "should cost" approach. It emphasizes that a "should cost" approach to determine a baseline for comparison with actual costs has been accepted to prove the amount of an equitable adjustment, citing *Teledyne McCormick-Selph v. United States*, 588 F.2d 808, 810 (Ct. Cl. 1978) (contractor entitled to equitable adjustment based on use of learning curve to estimate what the costs should have been if specifications had not been defective). *See also Illinois Constructors Corp*., ENGBCA No. 5827, 94-1 BCA ¶ 26,470, at 131,753-54 ("should cost" estimates accepted because the contractor presented "micro-level, detailed analysis by witnesses of estimates, actual expenditures and causation"). In other words, rather than use its bid prices as the floor for determining damages or a basis for further adjustment, Rohr uses what it maintains it should have cost to perform, but for the alleged Government-caused changes. It has also attempted to account for its own and Grumman's impacts.

The Government acknowledges the precedent for Rohr's approach (Gov't br. at 80), as do we. However, it argues that by choosing to avoid the issue of how much it underbid – as the Government contends it has – Rohr has only obscured the larger issue of whether Rohr's assessment of how much of the cost overrun on Lots 18 through 21 the Government is responsible for is reliable enough to serve as the basis for a damage award. It says that, in essence, Rohr has "buried" the exact extent of its underbid in the percentage of the cost overrun that Rohr does not assign to either Grumman or the Government. (R4, tab 6 at 12) Because the exact (or even the approximate) extent of the underbid is unknown, Rohr's assessment of "Rohr-responsible costs" is inherently unreliable. In the Government's view, it also follows that Rohr's assessment of "Government-responsible costs" is unreliable as a basis for a damage award.

We have two basic difficulties with the Government's position. First, the evidence with respect to Rohr's bid prices is equivocal. The Government argues that Rohr underbid Lots 18 through 21, and that Rohr could not reasonably have expected to perform Lots 18-21 at a price of $2,300,000 per shipset. The Government relied on an analysis performed by Mr. Hubbard of DCAA. Mr. Hubbard simply applied a nine percent escalation factor to

Rohr's costs for Lot 17 and assumed that the method produced a reasonable estimate of what Rohr's costs should have been for Lots 18 through 21. Rohr says the DCAA analysis prepared by Mr. Hubbard to support the "underbid theory" is pure conjecture. Inflation in Rohr's Standard Industrial Classification codes within the aerospace industry in the years when Lots 10 through 15 were performed ranged between 8 and 12 percent. However, for the years when Lots 18 through 21 were performed, inflation ranged between zero and four per cent. (Galleger, 21/180-84; ex. A-580) Moreover, Rohr points out that the Government's position is directly contradicted by a 5 August 1988 Government analysis, supported by a DCAA audit report, which reviewed the reasonableness of Rohr's proposed prices for Lot 20.

For Lot 20 Rohr had proposed a price per shipset of $2,709,601, including profit of 15 percent, or $2,363,677 per shipset at cost. The DCAA audit report questioned $665,279 in costs per shipset. On the basis of the audit, the Government rejected Rohr's proposed price as being unreasonably high and proposed instead a recommended price of $1,698,398 per shipset, or a $665,279 reduction to the price proposed by Rohr. (Ex. A-130) Mr. Hubbard admitted that the Government had questioned Rohr's price per shipset as being too high, and that his "underbid" argument presented at the hearing was an after-the-fact determination developed as a litigation position for this appeal. (Hubbard, tr. 20/86-89)

Second, and more importantly, Rohr has not based its case on a methodology that depends on establishing adjustments to its bid for purposes of claiming recovery based on the difference between its adjusted bid prices and the total costs incurred and, in light of precedent, which the Government acknowledges, it was not required to do so. Rohr has focused on the differences in the hours that should have been expended, by discrete time periods, in each of the pertinent areas and the hours that were expended, while accounting for non-DCAS causes of increased hours.

On the basic and key question of whether it was impracticable for Rohr to prove its costs directly, the Government argues that Rohr has not shown that it was impracticable to establish its actual costs directly and cannot. It offers three reasons. First, Rohr is a major manufacturing concern with a mature, sophisticated accounting system. Even if the system could not attract all of the costs, it should have been able to master at least some of them, which would have yielded a more accurate quantification of damages than Rohr has presented to the Board. Second, Rohr knew shortly after the changeover from DCAS-San Diego to DCAS-Santa Ana that it was experiencing an impact and had plenty of time and opportunity to attempt to track its costs more accurately. Third, Rohr retained experienced professionals to investigate the causes of Rohr's cost overruns at an early stage, not at or near the end of performance as is typical, who could have taken action to track the additional costs and allocate responsibility for the costs contemporaneously.

Rohr accounting system has, in fact, attracted all of the costs at issue here and in a manner that led the Government to stipulate reasonableness. In our view, what is really at

issue here is Rohr's failure to establish a separate cost charging system to collect the costs associated with DCAS's changes. Rohr's testimony has been that such a system could not be implemented in the areas of major assembly, common shops and services labor. (Fuener, tr.15/113-22; Helding, tr. 17/242-44; Carter, tr. 2/13-15) An early awareness of potential impact is not the same as the ability to collect separately the costs. Similarly, the early engagement of experienced professionals may not guarantee the result. On the other hand, the inability of an experienced professional to come up with the data might indicate that it could not reasonably be done. We are not prepared to fully subscribe to Rohr's claim that it would have had to assign a person to every Rohr worker on the production floor and monitor the worker's activities each day. However, we do think there is merit to the view that any type of charging system would have required the individual Rohr worker to know what was a change and what was not a change and to record accurately the impact of the DCAS changes. For example, in the case of a withhold tag, a worker would have to know whether the discrepancy noted was a normal withhold tag or a tag resulting from a DCAS change. The worker or his supervisor would have to know how much time was caused by the change. A worker transferred from one cost center to another would have to know how less efficient he was in the new cost center versus his normal cost center. The problem is further complicated by the fact that there were numerous changes and they occurred at various times. Any system would have had to be kept current as new changes occurred.

The Government says that Rohr could have done more, but made a "private, unilateral decision" not to proceed that deprived us of the opportunity to consider contemporaneous cost information and assess it in light of the alleged flaws (Gov't br. at 74). Putting to one side its objections to the evidence that has been presented (which we will separately evaluate), the Government has not addressed the validity of the reasons Rohr has advanced for impracticability. Given the nature, extent and timing of the DCAS-Santa Ana changes, we are satisfied that it was impracticable for Rohr to prove the costs for the major assembly, common shops and services elements of its claim directly.

Finally, in evaluating Rohr's evidence, we are not precluded from awarding compensation on the basis of a "jury verdict," although, as the Government points out, Rohr has not sought to recover on this basis. The jury verdict method of awarding damages may be used if (1) clear proof of injury exists, (2) there is no more reliable method for computing damages and (3) the evidence is sufficient for a court to make a fair and reasonable approximation of damages. *Dawco Const., Inc. v. United States*, 930 F.2d 872, 880-82 (Fed. Cir. 1991), *overruled in part on other grounds, Reflectone, Inc. v. Dalton*, 60 F.3d 1572 (Fed. Cir. 1995) (*en banc*), citing *WRB Corp. v. United States*, 183 Ct. Cl. 409, 425 (1968); *S. W. Electronics & Manufacturing Corp. v. United States*, 655 F.2d 1078, 1088 (Ct. Cl. 1981) (when confronted with the Government's clear liability and plaintiff's efforts to provide all available evidence on damages, the board was under a heavy obligation to provide compensation and it was error for the board to fail to award damages in the nature of a jury verdict where there was sufficient evidence to make a fair and reasonable approximation); *see also Triple "A" South*, ASBCA No. 46866, 94-3 BCA ¶ 27,194 (jury verdict approach to

calculating disruption costs); *Campbell Industries*, ASBCA No. 40436, 94-2 BCA ¶ 26,760 (jury verdict technique applied to apportion damages caused in part by Government changes and in part by contractor's own inefficiency). We believe the circumstances warranting the use of a jury verdict are present here and we have exercised this discretion in measuring Rohr's recovery for the inlet and glove portion of major assembly, services labor and special teams elements of Rohr's claim.

Rohr's Should Cost Methodology

In developing its should cost methodology, Rohr's basic approach was to look to the persons who had first-hand knowledge of the impact on the manufacturing floor, organize them into appropriate teams, and then have them assess historical statistical data from the company's performance records. The assessment teams were then asked to analyze the performance data, which had been collected and presented by the consultants, determine the reasons why the actual assembly line hours varied from the hours that would have been expected in a normal production environment, and assign responsibility for the excess hours. The data was presented on an individual cost center or function code basis and was divided into three-month periods. For each three-month period, the teams were asked to come to a consensus on the major cost causes for the hours above what was expected for their assigned cost center, the percentage of hours associated with each cause, and to assign responsibility to DCAS, Grumman or Rohr. (Fuener, tr. 15/122-23)

From February through April 1990, the Booz-Allen & Hamilton consultants assembled extensive statistical information from Rohr records about each major assembly cost center. They constructed data on a number of different indicators, such as: (1) withhold tags per unit by cost center; (2) tag days, which is the number of withhold tags multiplied by the number of days consumed to process the withhold tags; (3) flow time per cost center, which is the amount of time that a unit spent in a cost center; (4) 1575 volume, which is the number of inspection pick-up forms per unit by cost center; (5) part shortages, which is an identification of time periods when a part was showing zero inventory by cost center; (6) active weeks, which is the percentage of time that any hours are charged to a given unit while it is being worked in a cost center; (7) employee tenure, which was the amount of time that Rohr's workers had stayed in a cost center; (8) percent charged, which was the amount of the work week charged to a cost center by the employees assigned to that cost center; (9) concurrent units, which was the average number of units in a cost center at a given time; (10) employees per unit, which was a measure of efficiency to show how many employees were working on a unit at one time; and (11) out of station operations, which was another measure of efficiency to show whether the work on a unit was being performed sequentially. (Fuener, tr. 15/142-43; Helding, tr. 17/133-42; ex. A-510)

A new assessment team of Rohr personnel was assembled in Riverside on 10 and 17 April 1990 for a series of debriefing meetings. All of the pertinent statistical data gathered by the consultants was made available to the team in a fashion that allowed it to assess and

discuss what was happening in each cost center during the relevant time periods. (Fuener, tr. 15/137, 143-52; Helding, tr. 17/134, 141; ex. A-510) Each cost center and time period were addressed in an open and free flowing manner. The consultants encouraged a full airing of all points of view, pressing the participants to identify potential Rohr or Grumman problems. The meetings resulted in assessments of responsibility for many cost centers and time periods. However, a further meeting was necessary to complete the assessment process. (Fuener, tr. 15/152-58; ex. A-511 at 16-32). This meeting was held on 8 May 1990.

The Rohr participants in the May meeting represented all Rohr departments on the F-14 program, including Production, Industrial Engineering, Quality, Program Management, and Finance. The persons who attended were Messrs. Mike Roadick, Steve Carter, Dick Barlin, Richard Luksza, David Wilson, Geary Baker, Richard Bobb, Sean Galleger, Vendal DiGiacinto, and George Lounsbury. The ground rules for this meeting were the same as for the other meetings. An update meeting was held in December 1990 to make final adjustments before the claim was submitted to the Government. (Fuener, tr. 15/158-67; ex. A-509 at 1-15, 51-61, ex. A-511 at 44-53)

Two aspects of Rohr's methodology warrant comment at this point before we consider its application to the specific claim elements: the "flow time" analysis and the "withhold tag study."

"Flow Time" Measurements

One of the elements the consultants focused on was the amount of time that the inlet and glove units for Lots 18 through 21 spent in each cost center. For each manufacturing cost center in the major assembly area, Rohr's assessment teams were provided with "flow time" data in graph format for that particular cost center for 1988-1990. However, Rohr's consultants used a different definition of "flow time" in their analysis. And, it is conceded that a comparison of flow time data from Rohr's records to the consultants' statistics would be "apples to oranges."

The consultants used Rohr's labor records on the ground that they captured the "entire flow time" and developed an "active weeks" measurement. The consultants' flow time study measured the time period that employees in a cost center charged to a unit, regardless of whether the unit actually was in the cost center when the work was performed. (Ex. A-497 at 9; Helding, tr. 17/259, 262; Baker, tr. 21/171-72) The consultants measured flow time by the number of weeks a unit had labor hours charged to it by employees of a particular cost center. As Mr. Helding explained, the flow time was measured "from the moment that the unit enters the cost center and work has begun on the unit to the moment that the unit work is completed on the unit on the tail end. So if you started working one week and five weeks later you completed that work, then it would be a five week flow time." (Helding, tr. 17/258-59, 262-65) Thus, the analysis measured the number of weeks a unit had operations belonging to a specific cost center charged to it, regardless of the physical location of the

unit. Often the unit had moved to the next cost center while an employee from the earlier cost center performed some work on that unit. This measurement of flow time included the time when a unit was not being worked on at all and time when the unit might be out of station.

"Flow time" may also be defined as the average length of time it takes a unit to physically move through one cost center and this is the definition Rohr used in its operations. (Exs. A-399 through -405, -552, -47) Rohr has maintained that prior to the change in DCAS cognizance Rohr's major assembly flow time for inlet and glove units was 70 to 80 days and after the change in cognizance grew to more than 140 manufacturing days during the performance of Lot 20. No documentary support for the 70- to 80-day flow time has been cited; however, Rohr Riverside's director of assembly operations, Mr. Geary Baker, testified to a flow time "roughly in this range." Rohr has not attempted to make more than a general connection between the rough flow time estimates of the past and increases in flow time attributable to DCAS-Santa Ana actions. What Mr. Baker did present was his idea of the "best effort you could ever expect with everything being very predictable and being able to use the same type of acceptance criteria that we had in the past, the best you can expect from this program [F-14] out at Rohr is 77 [work] days." (Tr. 12/15-19; ex. A-398)

Rohr was behind schedule in its performance of Lot 18. In September of 1987, Rohr Riverside's director of assembly operations briefed a recovery plan. The plan had been in development for several months. The plan showed that Rohr would be close to two months behind the master schedule in the October 1987 time frame. It was Rohr's plan to begin to recover schedule in November 1987 and regain its master schedule position in October of 1988. Rohr gained some productivity, but did not begin to recover in November. Mr. Baker attributed this to Mr. Rumell's arrival. He testified that once the formal transfer to DCAS-Santa Ana took place in January of 1988, Rohr was not able to put an effective recovery plan in place, although it made several attempts. (Baker, tr. 11/209-14, 228-37; ex. A-45)

Matters reached a critical point in August-September 1989 and were addressed in the context of Rohr's resolution of its claim against Grumman. In September of 1989, Mr. Baker was directed to develop another recovery plan by Rohr's top management. His first effort was based on an analysis of Rohr's experience during performance of Lot 20, which began in mid-1988 and was on-going at the time. He identified an average flow time that was in excess of 140 manufacturing days and referred to the plan as an "excusable delay plan." He testified that Grumman was "shocked'' and considered the plan unacceptable. (Tr. 11/241-42, 252-57)

In response, Rohr, through Mr. Baker, developed a best efforts 100-day flow time plan in September and reached agreement on the plan with Grumman on 9 October 1989. On average Rohr met the 100-day flow plan, with a few minor exceptions; however, it did not meet the specific schedule commitments to Grumman. Consequently, it did not earn the

delivery incentives provided in the settlement agreement. The reason Rohr missed the specific shipment dates was that it did not start performance when it planned. It went from two-weeks late in starting to almost six-weeks late in starting during the performance of Lot 21. Rohr never met the plan in cost centers 17 through 45, but bettered the plan in cost centers 50 to 65, through the use of overtime. (Baker, tr. 11/254-55, 12/6-41, 50-56, 60-61; exs. A-398, -402, -403, -405)

Mr. Baker attributed the instability in the line to the lack of a consistent supply of bond components and withhold tag turn around time. In his view, cost centers 40 and 45 were very susceptible to MRB activity. He acknowledged that after the Method C was issued the turn around time on MRB tags improved, but DCAS's withdrawal did not solve all of their problems. Under DCAS-San Diego turnaround time on a normal tag was anywhere from 24 to 48 hours. If a "line stop" was involved, Rohr would have a response in 30 minutes to 4 hours. In his estimation, the post-Method C process took much longer. Rohr added five days to the schedule for SMRR processing (Gordon, tr. 12/239-40). From Mr. Baker's perspective, DCAS simply took itself "out of the loop" and transferred its responsibility to the Navy and Grumman. What was needed was "a functioning MRB system in place that was responsive and was considerate of the needs of the production line and its delivery requirements." (Tr. 12/62-67, 83, 87, 225-27)

The Government observes that Rohr's manufacturing flow time data shows that Rohr's final line cost centers always had sufficient work and were not standing idle. It argues that by not using Rohr's manufacturing flow time data, the assessment teams were reviewing "inflated" weekly flow time figures, thereby undermining the credibility of assignment of responsibility to DCAS. As an example of the differences, the Government points to the average flow time of 13.2 weeks calculated for cost centers 40/45 in 1988-1989, which it notes is equivalent to 92 calendar days. In contrast Rohr documents show a flow time for the cost centers of approximately 22 manufacturing days or 31 calendar days, almost 3 times less than the consultants' analysis. Moreover, it was not taking 31 calendar days for a unit to come out of the cost centers since multiple units were being constructed concurrently. (Exs. A-399, -497 at 9)

Perhaps, as Rohr observes in hindsight, it would have been appropriate to provide the assessment team with both sets of data. However, we are not persuaded this failure undermines the credibility of the analysis. Rohr's witnesses were not confused by the consultants' measurement approach. Mr. Baker, for example, certainly knew the difference. (Baker, tr. 21/175-76) Moreover, in our view, there is merit in Rohr's position that the consultants' approach more accurately reflects the disruption that was occurring and that in a stable work environment, the two methods should produce the same result, since employee time charged in a cost center should match the time that a unit physically entered and left a cost center. When the two methods do not produce practically the same result, there is an indication that work on the unit is being performed "out-of-station" — the unit is transferred to the next cost center, but work that should have been performed remains incomplete. When

the disparity between the two methods is great, as it is for nearly all cost centers here, evidence of substantial disruption exists due to the amount of out-of-station work. The analysis corroborates the testimony of Rohr's witnesses to this extent.

Rohr's Withhold Tag Study (The Hammond Study)

Mr. Richard Hammond of Rohr performed a detailed study[4] of all Rohr F-14 production withhold tags at the Riverside and Moreno Valley facilities from January 1988 through December 1991 that were elevated on a SMRR form to Grumman and NAVPRO for review. We found Mr. Hammond qualified to perform this study based upon his prior experience. We also found his testimony explaining the results of the study persuasive and the summaries prepared under his direction and control reliable. We have relied on the study in making our determinations. Some of the key findings are summarized below. (Hammond, tr. 13/124-29, 168-74, 198-202)

The study involved the review of 1,385 SMRRs, and 3,922 discrepancies that appeared on the withhold tags. For the period 1985-1991, there were 1,433 SMRRs written on the F-14 program, broken down by year as follows: 1985–16 SMRRs; 1986–9 SMRRs; 1987–23 SMRRs; 1988–53 SMRRs; 1989–433 SMRRs; 1990–858 SMRRs; 1991–41 SMRRs. Of the 858 SMRRs elevated in 1990, only 31 of them occurred after the Operating Guidelines took effect on 2 July 1990. (Hammond, tr. 13/183-84; ex. A-442 at 1)

Of the F-14 SMRRs elevated from 1988 through 1991, the 3,922 individual discrepancies broken down by year were: 1988–166 discrepancies; 1989–1,306 discrepancies; 1990–2,340 discrepancies; 1991–110 discrepancies. Of the 2,340 discrepancies elevated in 1990, only 237 of them occurred after the Operating Guidelines took effect on 2 July 1990. (Hammond, tr. 13/185; ex. A-442 at 3)

The study also broke down the number of F-14 SMRRs and individual discrepancies by three distinct time periods. Period 1 was from 1 January 1988 until 29 August 1989 (the day before DCAS-Santa Ana issued its Method C notice to Rohr and withdrew from MRB participation). Period 2 was from 30 August 1989 until 1 July 1990 (the day before the Operating Guidelines took effect). Period 3 was from 2 July 1990 until 31 December 1991 (the end of the study). The data for these periods is as follows:

Period 1	270 SMRRs	787 Discrepancies
Period 2	1,044 SMRRs	2,788 Discrepancies
Period 3	71 SMRRs	347 Discrepancies

(Hammond, tr. 13/185-86; ex. A-442 at 4-6) Of the total F-14 discrepancies elevated for Grumman and NAVPRO review during the years 1988 through 1991, Grumman engineering agreed with Rohr's assessment that the discrepancy was a minor nonconformance in 3,796 out of 3,922 discrepancies (96.8 percent). Of the remaining 126 discrepancies, Grumman

disagreed with Rohr in only 13 discrepancies (0.3 percent). The remaining 113 discrepancies (2.9 percent) were left blank on the documentation, and are inconclusive. (Hammond, tr. 13/187; ex. A-442 at 7)

Of the total F-14 discrepancies elevated for Grumman and NAVPRO review during the years 1988 through 1991, NAVPRO agreed with Rohr's proposed engineering disposition in 3,884 out of 3,922 discrepancies (99.0 percent). NAVPRO disagreed with Rohr in only 38 discrepancies (1.0 percent). (Hammond, tr. 13/188, ex. A-442 at 8) Of the 3,922 F-14 discrepancies elevated for Grumman and NAVPRO review during the years 1988 through 1991, 837 of them (21.3 percent) would have been treated as standard repairs in Rohr's MRB system prior to the DCAS-Santa Ana takeover. An additional 2,970 discrepancies (75.7 percent) would have been processed as minor nonconformances. Only 115 of the discrepancies (2.9 percent) would have been elevated by Rohr for review as major nonconformances. (Hammond, tr. 13/189; ex. A-442 at 9)

Of the 837 discrepancies that Rohr would have processed as standard repairs, DCAS-Santa Ana elevated nearly all of them as SMRRs between 4 January 1989 (the date when DCAS-Santa Ana partially rescinded Rohr's standard repair manual) and 19 July 1990). The discrepancies that were elevated after July 1990 represent standard repairs that had been eliminated in the revised version of Rohr's standard repair manual due to DCAS-Santa Ana's objections to specific repairs. (Hammond, tr. 13/189-93; ex. A-442 at 10)

Of the 2,970 discrepancies that Rohr would have processed as minor nonconformances prior to the DCAS-Santa Ana takeover, the majority of them were elevated during the period when DCAS-Santa Ana had revoked Rohr's MRB authority, from 30 August 1989 to 2 July 1990. However, a significant quantity of minor nonconformances were elevated to SMRRs immediately after DCAS-Santa Ana assumed cognizance at Rohr Riverside in January 1988. (Hammond, tr. 13/193-95; ex. A-442 at 11)

From the 1,385 SMRRs examined in the study, Rohr calculated the average length of time required to process its withhold tags from the tag origination date until the date of the Rohr MRB Engineer's proposed disposition. For the period 1988-1991, the average time was 12.5 calendar days. This time period consists of the number of days when Rohr was processing the withhold tag, namely the time prior to DCAS-Santa Ana review and elevation to Grumman and NAVPRO. (Hammond, tr. 13/198-203; ex. A-442 at 14)

For the 2,970 discrepancies that previously would have been treated as minor nonconformances under Rohr's MRB system, the average amount of delay per discrepancy that resulted from the elevation to Grumman and NAVPRO was 16.2 calendar days. This period is measured from the date of the Rohr MRB engineer's disposition to the date of the NAVPRO approval of the SMRR. (Hammond, tr. 13/202-05; ex. A-442 at 15)

For the 837 discrepancies that previously would have been treated as standard repairs under Rohr's MRB system, the average amount of delay per discrepancy that resulted from the elevation to Grumman and NAVPRO was 14.9 calendar days. This period is measured from the Rohr withhold tag origination date to the date of the NAVPRO-Grumman approval of the SMRR. (Hammond, tr. 13/163-64, 205; ex. A-442 at 16)

The Government's Withhold Tag Study

The Government submitted its own withhold tag study. The purpose of the Government's withhold tag study was to rebut Rohr's assertion that the number of F-14 withhold tags at the Riverside facility increased after DCAS-Santa Ana assumed cognizance of that facility and to demonstrate that DCAS-Santa Ana responded in a timely manner to Rohr's withhold tags at the Riverside facility. (McSpadden, tr. 20/143-44, 22/22-23) The Government's initial study was based on an erroneous data base and its proffered summary was withdrawn because of the mistakes. We gave the Government the opportunity to correct the errors.

The initial study was shown to include 1,361 withhold tags that were not F-14 parts, 2,313 withhold tags for parts manufactured at Rohr's Chula Vista facility, 1,233 rework and scrap tags that were not submitted to DCAS, 422 withhold tags on F-14 spares or KB retrofit programs not at issue in this appeal, and 55 withhold tags that appeared twice in the study. When the errors were corrected, along with others found during the Government's review, approximately 62 percent of the original sample was left. (Tr. 20/178-81, 22/8-12) Despite the Government's efforts, data entry errors were still shown to exist. (McSpadden, tr. 22/52, 59-60) Moreover, during the review process, the Government examined approximately 6,637 tags and made a "considerable number of changes" in the data entered, which could not be identified and produced unexplained differences in results when Rohr performed its calculations on what should have been the same data. (Tr. 22/70-73)

The Government's revised study covered the period from April 1983 through December 1991, but does not account for the effect of reduced lot sizes. Since the number of aircraft ordered steadily decreased from Lots 15 through 23, the evidence on whether the quantity of withhold tags per aircraft increased or decreased is equivocal. Moreover, the Government's representative testified, in examining a Government graph of withhold tags by month, that, "it look[ed] like the quantity of tags [per aircraft] was going up." (Ex. G-108D at 9; McSpadden, tr. 22/24-25) However, the graph itself included 675 tags that the Government acknowledges should have been excluded. The effect on the portrayal of the data is unknown. (McSpadden, tr. 22/20, 23; ex. G-108D at 9) In contrast to the Hammond study, the Government did not analyze the number of individual discrepancies per withhold tag, nor did it consider the delay effect of elevating a withhold tag on an SMRR for Grumman and NAVPRO review. (McSpadden, tr. 22/25, 30, 36, 45-46; ex. A-584 at 92 line 4141, ex. A-585)

Though we admitted the revised study into evidence (Ex. G-108A through D; tr. 22/20-21), we have given it little weight because of the defects in the analysis discussed above. For its part the Government has argued only that its analysis of MRB tags confirms that tag processing time did not increase (Gov't br. at 66). However, in view of the Hammond study and the defects in the Government's study, we are unwilling to credit it in this regard.

The Consultants' Analysis of Withhold Tag Variables

Using the statistical data that had been obtained for each cost center, Mr. Helding performed a regression analysis of the data to determine if there was any statistical correlation between cost center flow time and hypothesized causes and effects. The analysis was limited to testing statistically the information received from Rohr personnel on the impact caused by the DCAS-Santa Ana changes, and was not used in the pricing of the claim. (Helding, tr. 17/168; ex. A-497 at 11-25) Mr. Helding felt that the analysis corroborated the factual information that Rohr personnel provided to the consultants. (Helding, tr. 17/169-80; ex. A-497 at 18a) The analysis also persuaded Rohr that withhold tag variables (tag days, average tag time, tag volume, and active weeks) were the dominant factors influencing flow time fluctuations in Rohr's inlet and glove cost centers. In this respect, Mr. Helding found that part shortages were not as major a "driver" of flow time volatility as tag variables. (Helding, tr. 17/218, 219; ex. A-497 at 24).

The Government takes exception to the regression analysis and argues that, in any event, parts shortages had a greater effect on Rohr's performance than the regression analysis indicates. (Gov't br. at 62-63). Rohr agrees that the analysis cannot be used to show an absolute cause and effect relationship between two variables, and Mr. Helding so testified. (Helding, tr. 17/222) The Government's expert, Dr. Robert Ilderton, also provided testimony to the same effect (Ilderton, tr. 19/8-11; ex. G-181). We conclude that the regression analysis standing alone is inconclusive. Rohr emphasizes in this regard that the regression analysis is not Rohr's primary evidence of causation in this appeal, but rather was presented to show potential statistical correlation among the types of data compiled. It says that the results served to confirm the evidence of flow time disruption provided by Rohr's witnesses. Certainly, the analysis does nothing to detract from the testimony of Rohr's witnesses and it does support the idea that tag variables were more influential than parts shortages. We have considered the Government's evidence regarding the role parts shortages played in disrupting Rohr's performance and have taken it into account in arriving at our decision.

Major Assembly

The major assembly assessment meetings were memorialized in a set of declarations, which are part of the record. Six of the declarants also testified at the hearing: Messrs Steve Carter, Mike Roadick, Rick Luksza, George Lounsbury, Tony Perez and Geary Baker. (Carter, tr. 1/169-72; Roadick, tr. 4/103, 104; Lounsbury, tr. 9/57-58; Luksza, tr. 10/158-59;

T. Perez, tr. 11/88-89; Baker, tr. 12/98-99; ex. A-526 through -529) When it was determined that Rohr or Grumman was responsible for an increase in labor hours, the hours were included in the hours Rohr expected to incur in that cost center or excluded from the DCAS impact assessment.

The parties have stipulated that a total of 580,910 major assembly hours were incurred on Lots 18-21. Of the total major assembly hours, 400,551 hours were identified with inlet and glove production, while 180,359 hours were identified with nacelle production. (Ex. A-494 at 1) Rohr's learning curve methodology yielded a total of 414,396 expected hours. The expected recovery curves for each cost center were initially established without accounting for work changes or design changes in the product. Rohr made an adjustment to account for F-14D model changes that began in Lot 20. The F-14D changes were made to improve the aircraft's electronic defense systems and involved some hardware changes to Rohr's components. (Carter, tr. 1/156-57) The changes consisted of a wheel well modification, a bleed door assembly and installation, and a vane close out change. The consultants examined the work content of the changes and the labor hours of the last few units before the D model change and the first few units after the model change. They also made a determination, with Rohr's assistance, of how much of the disruption was attributable to the model changes, and how much was attributable to DCAS interference. The total adjustment for the F-14D model changes was 9,545 hours, which is not disputed by the Government. These hours were added to the baseline in the quantum calculations for major assembly. (Helding, tr. 17/108-14; ex. A-495 at 198)

A second adjustment was made to the total major assembly hours for large increases or "spikes" in the labor hour data. Any spike in the actual hours was removed from consideration, and replaced with the average hours of adjacent units. These hours were removed on the assumption that unusual spikes in hours were attributable to one-time Rohr or Grumman-caused events in manufacturing the unit. This adjustment resulted in the removal of 14,294 hours from the total major assembly hours for Lots 18 through 21. This adjustment is not disputed by the Government. There were also "valleys" in the hours-per-unit data which were not adjusted, as an added element of conservatism in the quantum calculations. (Fuener, tr. 15/216; Helding, tr. 17/114-18; ex. A-495 at 199-220; app. br. at 146, 211)

The two adjustments, in effect, resulted in a total of 23,839 hours being removed from the hours that could be assigned to DCAS.

The Government does not question the consultants' seriousness of purpose or call for openness in assessing the responsibility problems. However, it argues that the good intentions of the organizers cannot make up for the inherent flaws in the "debriefing session" format. It says that its unrealistic to expect that senior Rohr managers involved could give an unbiased opinion about who was to blame for the loss.

The credibility of the witnesses must be assessed in light of a recognition of their interests and we have evaluated their testimony with an understanding of their perspective. With respect to the methodology itself, we do not share the Government's view that it is inherently flawed. Apart from the two adjustments discussed above, the assessments do, in fact, attempt to account for non-DCAS causes of excess hours. Both Rohr and Grumman causes are addressed. In this connection, while the Government considers the failure to draw Grumman into the formal process "inexplicable," we do not consider it a flaw. It is enough that Grumman causes, as well as Rohr's own contributions to excess hours, are accounted for as part of Rohr's overall burden of proof. In our view then, the objection is not properly to the process itself, but how well Rohr has accounted for non-DCAS causes. Similarly, questions about the timeliness of the assessments are to be evaluated in the context of the quality of the evidence presented. In summary, we believe the methodology, including the use of learning curves in the analysis, is reasonable.

Rohr claims $6,413,447 in costs (based on a composite labor and overhead rate) for the major assembly element. After adjustments made by Rohr's assessment teams, the claimed major assembly hours attributable to the DCAS-Santa Ana changes are 164,484 hours. Of this number, 138,070 hours relate to the inlet and glove units and 26,414 hours to the nacelle.

The Government has not questioned the concept of applying a learning curve analysis to the major assembly element. However, it does take strong exception to Rohr's specific applications. We discuss the learning curve approach selected and the adequacy of Rohr's proof below.

The Inlet and Glove Element of the Major Assembly Claim

Rohr had experienced learning on the F-14 program from 1969, when the program began, until the end of Lot 17 in June 1986. The early inlet and glove units on the F-14 program were produced at an estimated 6,000 hours per unit, and by the end of Lot 17, hours had reduced to approximately 2,000 hours per unit. At the point of the A+ model changeover in January 1987, Rohr's major assembly line for the inlet and glove had produced approximately 1,300 units and had experienced, according to Rohr, an overall efficiency gain equal to an 80 percent learning curve. (R4, tab 382) At the time of the model change, Rohr experienced a six and one-half month shutdown during the June 1986 through December 1986 time period as opposed to the two months originally scheduled. (Helding, tr. 17/100, 101; ex. G-81 at 52, aircraft Nos. 540-557) As a result of the production gap, the model change from the A to the A+ and start-up problems, Rohr lost some of the learning that it had realized in Lots 1 through 17. The hours in Lot 18 increased to the 4,000 to 5,000 hours per unit range and the consultants ultimately used 4600 hours as the starting point for the recovery curve calculations. (Helding, tr. 17/101-05; Hubbard, tr. 16/84; ex. A-552 at 8-9)

Based on information provided by Rohr's Industrial Engineering Department, the Booz-Allen & Hamilton consultants selected November 1987 as an appropriate starting point for when learning should have begun again on the F-14 program following the shut down and the model change. By this time, Rohr had been performing Lot 18 for 11 months, since January 1987, and approximately one-half of the Lot 18 units had been delivered to Grumman. The consultants also relied on a September 1987 Rohr recovery plan that showed learning beginning to occur in November 1987, considering it credible and realistic. (Lewis, tr. 16/177-79; Helding, tr. 17/124-26)

As previously noted, in September of 1987, Rohr Riverside's director of assembly operations, Mr. Geary Baker, briefed a recovery plan. The plan had been in development for several months. The plan showed that Rohr would be close to two months behind the master schedule in the October 1987 time frame. It was Rohr's plan to begin to recover schedule in November 1987 and regain its master schedule position in October of 1988. Rohr planned to increase the number of employees in the final cost centers from 41 to 53 employees. The "need dates" for additional manpower in the recovery plan ranged by cost center from 1 October to 1 November 1987. (Baker, tr. 11/222-24; ex. A-45 at 5) Labor hours were expected to increase to approximately 4,200 hours per unit as new employees were added and then start coming down what Mr. Baker referred to as a "very steep improvement curve" (tr. 11/216) in November 1987.

The Government questions Rohr's selection of a 1 November 1987 starting date for the application of the learning curve, saying that it is based upon "consultants' predictions," and that Rohr "is unable and unwilling to consider disruptive events above and beyond a simplistic six month work break." (Gov't br. at 113) Based on our review of the record, we do not believe it is unreasonable to look to November 1987 as the point in time when learning should have begun given the status of Lot 18 performance after the production break. The September 1987 recovery plan does not detract from this conclusion and, in any event, we are not required to validate the plan in order to agree with the selection of November.

Having selected November 1987 as the start date, the starting point for the learning curve was determined on an individual cost center basis. Since there was typically more than one unit in each cost center at any time, the consultants averaged the labor hours for the units in each cost center as of 1 November 1987. The composite total of the major assembly labor hours for all of the cost centers was 4,646 hours per unit. (Lewis, tr. 16/185-87; Helding, tr. 17/126-28; ex. A-495 at 221-315)

To determine the appropriate learning curve slope to use as the baseline of what Rohr should have expected, the consultants examined Rohr's historical experience in recovering from production disturbances on an individual cost center basis. (Ex. A-498) According to the consultants, Rohr's historical recovery experience ranged between 80 and 96 percent. The majority of the cost center curves were between 90 and 92 percent. The average of all of the recovery slopes was 90.3 percent, and the median was 90.5 percent. The consultants'

adjusted the learning curve upward to 92 percent for each inlet and glove cost center as a measure of conservatism. (Lewis, tr. 16/173-74, 179-83; Helding, tr. 17/119-23; ex. A-552 at 13; ex. A-553 at 13-14) Rohr points out that the use of a 92 percent learning curve is consistent with the Government's method of evaluating Rohr's expected labor costs in F-14 cost proposals. It notes that the Government used a 90 percent learning curve in estimating Rohr's anticipated labor costs in a 5 August 1988 review of Rohr's Lot 20 cost proposal. (Hubbard, tr. 20/86, 89; ex. A-130 at 29)

The Government challenges Rohr's "recovery" learning theory as unproved and unsupported. It asserts that Rohr's recovery learning curve methodology has not been recognized by any authority, apart from Rohr's own witnesses. (Gov't br. at 107-08) The Government's expert witness, Dr. Robert Ilderton, testified that Rohr's recovery learning curve theory diverges from traditional learning curve theory. Traditional learning curve theory proposes that after a disruption in production, labor hours will revert back to an earlier period on the experienced learning curve and repeat the same pattern of improvement. (Ilderton, tr. 18-177, ex. G-179) In contrast, Rohr's recovery learning theory holds that recovery from a disruption will result in a recovery learning slope that converges with the long-term learning curve within a relatively brief period of time. This recovery curve has both a different rate of learning and a different slope than does the long term learning curve. According to Rohr the rate of recovery in a given case may be more or less aggressive than the long term learning curve (Lewis tr. 16/165); in this case, recovery learning was expected to result in a "relatively steep improvement curve." (App. br. at 144; ex. A-553) Rohr's expert refers to the starting point and recovery slopes as key variables in the application of the Rohr recovery theory. Rohr's calculations assume that hours per unit will follow a new learning curve beginning with unit one after a disruption. (Lewis tr. 16/172, 187)

In Dr. Ilderton's opinion, it was more appropriate to determine Rohr's long-term learning rate, and then revert back to an earlier period on the long-term learning curve to a point equivalent to the amount of lost learning that Rohr experienced during the six-month production shutdown. He observed that "[g]iven the large number of units produced, the multiplicity of cost centers, and the instability of hours per unit within cost centers, it is not surprising that a number of periods in which the unit hours declined sharply from a peak can be identified." He also noted that in contrast to the "recovery periods" used in calculating learning curve percentages, Rohr did not identify the unit in Lot 18 with the highest number of hours as unit 1. In his view, Rohr was "starting the recovery curves arbitrarily with whatever comes up as a high unit and proceeding to a low unit. But when the[y] apply it . . . they apply it to quite a low unit to begin with." By Dr. Ilderton's analysis if Rohr had performed the same calculations treating the unit in Lot 18 that had the greatest adjusted hours as unit 1, the calculated excess hours would have been 77,056 hours, significantly less than Rohr has claimed. (Ilderton, tr. 18/170-72; ex. G-179 at 5-6)

Furthermore, in the Government's view, Rohr should have determined its learning curve on an aggregate "all-up" basis instead of on the basis of variations in the data

experienced at the individual inlet and glove cost centers. Or, as put by Dr. Ilderton, Rohr used "figures for individual cost centers which, of course, since they have less data are more volatile and will obtain more extreme up and down shifts." (Ilderton tr. 18/191) The Government argues that while Rohr maintains that aggregate data should not be used because it results in very low slopes and is therefore meaningless (Lewis tr. 16/216), the consultants initially developed recovery curve percentages on an all-up basis. When analyzing aggregate all up data, the consultants' inlet and glove recovery curves are between 94 to 97 percent. (R4, tab 382) Dr. Ilderton calculated that if the consultants had used an average 96 percent rate, the excess hours would be less than half the hours claimed. (Ilderton, tr. 18/187)

Dr. Ilderton's view is that long-term learning will repeat itself following the extended interruption. (Ilderton, tr. 18/176-77) Dr. Ilderton's slope and retained learning calculations are derived from Rohr's learning curve appendix data set, which was prepared by its consultants. (R4, tab 382) He calculated a slope of 74.24 based on three calculations of data for units between 10 through approximately 665. Dr. Ilderton then selected unit 42, having a value of 4,430 hours, as the point at which he believed the learning process would repeat itself. Under this approach, Dr. Ilderton calculated excess hours of 67,310 for the inlet and glove, as opposed to the 138,070 hours claimed by Rohr. Dr. Ilderton's calculation of excess hours includes the 9,545 hour "credit" for the F-14D model changes in Lot 20. (Ilderton, tr. 19/39-40, 66, 75-76, 127; ex. G-179 at 2, 7)

Dr. Ilderton recognized that the data was "not wonderful." He also had doubts about the use of a cumulative average curve, which predicts a sharp drop in unit labor hours for the first units produced, as opposed to the unit curve theory. He felt the cumulative average curve did not fit the data well. He would not have accepted the data if it had not been in fair agreement with other sources of information on what one would expect from operations of this type. He pointed to various studies which indicated that the rate one would expect in aircraft assembly and airframe work is about 75 to 80 percent and, in some cases, perhaps as low as 70 percent. He felt that the 74.2 percent curve was generous to Rohr, pointing out that Rohr had computed an 80 percent rate. (Ilderton, tr. 18/227-29, 19/76-77) Rohr's learning curve appendix offers several calculations of long-term learning rates for various ranges of production units. For example, for units 10 through 100, a 77 percent rate was calculated, while for units 10 through 1280 (through Lot 17) an 80 percent rate was calculated. The overall conclusion was that the "long run learning curve appears to be around 80%."

Rohr has argued in reply that the evidence shows that Dr. Ilderton did not perform his learning curve calculations in compliance with the method he espoused and failed to stay on the learning curve in selecting Unit 42. Rohr argues that if he had, the point he should have selected would have been between Unit 14 and Unit 15. A calculation using a baseline of a 74.2 percent learning curve beginning with Unit 14.39 (4,646 hours), appropriately adjusted, results in 138,979 excess hours, in comparison to the 138,070 excess hours associated with the inlet and glove. (Galleger, tr. 21/214-23; exs. A-574, -575, -582) In Rohr's view, the

disagreements between Rohr's experts and the Government's expert are largely academic. When the method proposed by Dr. Ilderton is applied properly, the results produced are nearly identical. Rohr argues that under the circumstances its method produces a result that is appropriate and fair to the Government. (App. reply br. at 49-50)

Based on the evidence presented, the "recovery" learning curve theory presented by Rohr's expert, Mr. Lewis, appears to be without support. Dr. Ilderton testified that he had never encountered the Rohr recovery concept. (Ex. G-179 at 3; Ilderton, tr. 18/150, 177, 223) Mr. Lewis acknowledged that the theory has not been published and since the Grumman/Rohr claim it had only been utilized by Mr. Lewis in other Rohr claims work. (Lewis, tr. 16/267) Though the theory has not been published, Rohr offered a book by Mr. Jason Smith, entitled "LEARNING CURVE FOR COST CONTROL" (Institute of Industrial Engineers, 1989) as support for its position. The portion of the book cited is aimed at quantifying a correlation between the length of time of a production gap and attendant degree of loss of learning. On cross-examination, Mr. Lewis admitted that the pattern of improvement following a disruption posited by Mr. Smith's description is consistent with Dr. Ilderton's own position, and different from the recovery learning curve theory presented by Rohr. (Ex. A-169 at 50, figure 13.1; Lewis tr. 16/198-99)

Dr. Ilderton is well qualified in the area of learning curve theory and practice. We found his testimony in this area persuasive. We are also troubled by the apparent artificiality of the excess hours generated by the individual cost center analysis when contrasted with the results of an "all up" analysis or with the results obtained if Rohr's methodology was applied to the unit in Lot 18 with the highest number of hours. We note in this regard that the nearly identical results produced by Rohr's application of Dr. Ilderton's long-term learning curve overlooks, as discussed below, what the Government's expert was trying to accomplish with his analysis. More importantly, it does not validate Rohr's own methodology. Under the circumstances, we have no confidence in Rohr's "recovery" curve methodology and do not believe that it is a sound basis for supporting a recovery for any DCAS-caused disruption.

On the other hand, based on our review of the record, we are convinced that DCAS's actions did disrupt major assembly operations and that some measure of recovery is warranted by the evidence. We believe that Dr. Ilderton's calculation offers a reasonable starting point. Dr. Ilderton calculated 67,310 excess hours based on a 74.2 percent learning curve, although he was doubtful that the conditions for learning were present in November of 1987. His calculations were aimed at providing a practical way of recognizing a return to the long-term learning curve after the break in production in Rohr's circumstances. Though Rohr has criticized his approach as at odds with the theory he espouses, we believe it is a rational way to recognize the disruption. Dr. Ilderton's decision was a conscious one. As he testified, he knew before hand that unit 42 at 4,430 hours was off the long-term learning curve. He justified his selection on the ground that it represented about the level of hours that were experienced in November 1987 and he assumed a progression beyond that point similar to what was experienced in the learning curve appendix. To him it was not relevant to

go further back. He was trying to determine what would happen if past experience was repeated. He "stayed on the pattern which was experienced in the past, which to me is the relevant thing." (Ilderton, tr. 19/79-82, 84-86) We agree. The selection may not be perfect, but it is a practical and reasonable way to recognize DCAS-caused disruption and we adopt it. The 67,310 excess hours already accounts for 9,545 hours for which Rohr has accepted responsibility (ex. A-495 at 198). We believe the 67,310 excess hours must be further reduced. First, 3,280 excess hours incurred in Cost Centers 10/20, 19/35 and 17 for which Rohr has also accepted responsibility should be deducted, for a revised total of 64,030 excess hours. (Ex. A-495 at 201, 204-05, 213) Second, the excess hours should be further reduced to account for the fact that Rohr has assigned excess hours to DCAS for the period July to October 1990, while we have concluded that recovery should not extend beyond June of 1990, just prior to the effective date of the Operating Guidelines. For the period January to October 1990 Rohr assigned 42,642 hours to DCAS. We think a reasonable approximation of the hours to be subtracted for the 3-month period can be arrived at by using a monthly average for the 9-month period of 4,738 hours. (Ex. A-495 at 213) The resulting 14,214 hours for the 3-month period amounts to 10.3 percent of the 138,070 excess hours Rohr assigned to DCAS in the inlet and glove area. We believe a reasonable approximation of the hours to be deducted for the 3-month period can be arrived at by reducing the 64,030 excess hours by 10.3 percent, for a total of 57,435 excess hours. Finally, we cannot ignore the fact that Rohr contributed to the additional costs incurred throughout the claim period. Or, in other words, DCAS was not responsible for all of the additional hours above the curve. Some further adjustment is in order. In this regard, according to the Government's analysis, for lots 20 and 21, the only lots performed exclusively under the inspection authority of DCAS-Santa Ana, Rohr assigned the Government 76.2 percent of the overrun. We believe that a fair and reasonable approximation of Rohr's remaining responsibility can be arrived at by assigning Rohr responsibility for 23.8 percent of the excess hours and limiting its recovery to 76.2 percent of the 57,435 excess hours we have identified. Consequently, we conclude that 43,765 excess hours are attributable to DCAS for the inlet and glove element of major assembly. Based on the appropriate labor and overhead rates ($40.08), Rohr is entitled to $1,754,101.

The Nacelle Element of the Major Assembly Claim

Cost centers 75 and 80 involve the assembly of the daily and weekly doors. The daily and weekly doors are part of the nacelle assembly. These cost centers were separate work stations and generally had their own set of assembly personnel. The operations in these centers had no relationship to the final line cost centers for the inlet and glove. (Roadick, tr. 4/21-22, 38-40; ex. A-4, Nos. 4-17, 4-31, 4-32; ex. A-501) Rohr's consultants determined that the two cost centers were not affected by the Lot 18 start-up problems that impacted the inlet and glove. The consultants also decided that an 86 percent learning curve should be used as the baseline for these two cost centers. Moreover, the learning curve was applied at the beginning of Lot 18 in January 1987, because recovery from the six-month production

gap was observed at that time. (Lewis, tr. 16/183-84, 214; Helding, tr. 17/123-24) Based on its analysis, Rohr assigned 26,414 excess hours to DCAS-causes.

The Government does not question that learning began in January. It notes that the cost centers experienced subsequent improvements in costs and a declining learning curve for cost center 80 and cost center 75, respectively. In the Government's view, however, the data provides no evidence that the transfer of DCAS responsibility disrupted production or increased labor hours. (Ilderton, tr. 18/207-09, 217, 220). Moreover, it takes exception to the recovery learning curve methodology employed.

The 86 percent rate used by Rohr for cost center 75 and cost center 80 is a composite. Rohr's justification for using an 86 percent recovery rate is based on calculated recovery curves of 84 percent for cost center 75 and 87 percent for cost center 80. Dr. Ilderton also questioned Rohr's calculations. Data required to estimate learning curve slope and units of retained learning for nacelle major assembly were not available. If the estimates for inlet and glove are used, the expected hours exceed the adjusted hours for both the cost centers. According to Dr. Ilderton, if Rohr had used the same method it used to calculate recovery curves for the inlet and glove element, recovery curves for cost center 75 and cost center 80 would result in slopes of 90 percent and 95 percent, respectively, instead of 84 percent for cost center 75 and 87 percent for cost center 80. Substituting a 90 percent curve in cost center 75 for the 86 percent curve would result in a determination of 1,562 excess hours. In the case of cost center 80, substituting a 95 percent learning curve would eliminate any claim since the expected hours would exceed the adjusted hours by 3,751 hours. Dr. Ilderton also suggested that if Rohr had used the program described in his thesis to calculate the slope for the recovery period, an 88 percent curve could be applied to cost center 75, resulting in a determination of 2,610 excess hours. For cost center 80, a 92 percent curve would be obtained and 4,777 excess hours calculated. He was not, however, espousing this method as an alternative and we do not understand it to have been intended as a substitute computation for Rohr's recovery curve methodology. (Ex. G-179 at 6-7, ex. A-180 at 12, ex. A-498 at 52-53; Ilderton, tr. 18/207-08, 210-21)

In reply, Rohr maintains that in the case of cost center 80, there were actually two peaks in the data, and two recovery periods. The recovery slopes for these two peaks in cost center 80 were 86 and 81 percent. It says that Dr. Ilderton's 95 percent recovery curve improperly considered the second peak as a part of the first recovery which skewed the results. (Lewis, tr. 16/271-74; ex. A-495 at 309) With respect to cost center 75, Rohr maintains that Dr. Ilderton's 90 percent curve for cost center 75 simply averages all of the up and down effects in the cost center and produces an inaccurate result. The cost center involves the production of left hand and right hand doors and since the tasks in making the doors are different, the doors should be examined separately. Mr. Lewis maintained that recovery curves range between 84 and 89 percent for each of the two types of doors. (Lewis, tr. 16/272-74; ex. A-495 at 302)

We do not have to resolve the question of which "recovery" curve percent is appropriate, although we do not find Rohr's reply compelling. Dr. Ilderton's analysis has raised serious questions about the reasonableness of Rohr's excess hour computations. Rohr has used the same basic learning curve methodology in determining excess nacelle hours that it used in connection with the inlet and glove, albeit with an even steeper or more aggressive learning curve slope than the 92 percent curve used for the inlet and glove. For the same reasons discussed in connection with the inlet and glove, we do not consider the methodology a sound basis for supporting a recovery for any DCAS-caused disruption. Rohr is not entitled to recover for this element.

Common Shops: Fabrication; Subassembly; and Adhesive Bond Labor

Rohr's seeks a total of $4,576,926 for the common shops element of its claim. Rohr's has four common shops, which are identified by function codes: FC-11 fabrication (sheet metal); FC-12 machine shop; FC-16 subassembly; and FC-17 metal bond shop. The fabrication and machine shops are located in Chula Vista, the subassembly operations are located in Chula Vista and Riverside, and the metal bond shop is located in Riverside. (Carter, tr. 1/43; Baker, tr. 11/84; ex. A-508) Rohr seeks $2,605,602 for fabrication, $1,257,328 for subassembly and $713,996 for metal bond. (Ex. A-550) No claim is made for machine shop operations. Rohr also emphasizes that it does not seek recovery for common shops hours in Lots 18 through 21 until after DCAS-Santa Ana arrived. (Ex. A-495 at 5-22)

One distinction between major assembly and common shops is the extent to which Rohr's personnel are dedicated to specific operations. In major assembly workers are assigned to the F-14 program on a full-time basis. In contrast, in the common shops, workers are qualified to operate certain pieces of machinery, but they process orders for parts on all military and commercial programs. In pricing the common shops element, Rohr's consultants adjusted their methodology to account for the existence of multiple programs. Rohr first determined how many hours were incurred on a shipset basis over the pertinent time periods. The consultants then calculated how many hours Rohr's performance should have taken.

Rohr's consultants employed a 92 percent "recovery" learning curve beginning in January 1988 from the 1987 average hours for the common shops in setting the baseline of the expected hours. In addition, to capture the effect of any systemic changes a commercial index was created from a number of mature commercial programs and the hours incurred in these programs were analyzed against their standard hours. If the actual hours increased in comparison to the standard hours, then Rohr increased the F-14 expected hours on the assumption that a systemic change unrelated to DCAS had occurred. Rohr determined that when the commercial index increased, it meant that Rohr's performance had degraded, but when the commercial index decreased, it meant that Rohr's performance had improved. The learning curve hours multiplied by the commercial index produced the expected hours

per unit. Adjustments were also made for other specifically identified non-DCAS related causes to arrive at the excess hours attributed to DCAS in the claim. (Gee, tr. 18/9-10, 15-25; ex. A-495 at 316-34)

The Government again questions Rohr's use of a recovery learning curve. It also argues that common shops is the area least susceptible to learning curve effects and a showing of disruption. The work performed in the Rohr common shops utilized different employees from lot to lot, order to order, and from commercial to military work. (Ilderton, tr. 19/17; ex. A-555, ¶ 4) Since employees do not work on a project from one lot to the next, it is logical that employee learning would not be aggressive and that improvements would instead be realized from general industry and systemic improvements. (Ilderton, tr. 19/13) Even if there is employee learning against which to apply a recovery learning theory, there must also be a disruption to recover from, a starting point. In the Government's view, the only disturbing event could be the production gap. It emphasizes, however, that there was no interruption in common shop operations and most of the work on Lot 18 was completed before 1987. For example, of the 40,756 hours incurred for inlet and glove sheet metal fabrication on Lot 18 through December 1987, only 7,067 of these hours were incurred in 1987. (Ilderton, tr. 19/14-18; ex. A-195 at 316)

From the Government's perspective, another inconsistency is that Rohr's common shop recovery curve calculation projects efficiencies greater then those experienced before the alleged disruption. Rohr's recovery curve projects performance efficiencies that are better than the average in Lot 17. To compensate for this, Rohr had a feature in the spread sheets to prevent hours from going below the actual Lot 17 hours. Moreover, Rohr projected a level of efficiency in three of the four common shop functions far better than achieved previously. (Gov't. br. at 127; tr. 18/48-51; R4, tab 372 at 16; ex. A-495 at 316, 318, 320, 324) Dr. Ilderton also pointed out that performance factors for F-14 production were generally increasing (worsening) for production for Lots 15 to 19 through the end of 1987. In his view, a projection of past trends would indicate that performance factors could be expected to continue to get worse, rather than improve sharply as projected by Rohr. (Exs. G-180, A-495 at 317; tr. 18/156-57, 19/23-27)

Rohr has provided no persuasive rebuttal to the Government's analysis. It argues that the Government's approach to common shops produces no recovery, which it maintains is untenable in light of the evidence of disruption that occurred in Rohr's bond shop. The problem, however, is a failure of proof, not necessarily the absence of a disruption. Rohr's methodology for proving the common shops claim is simply not convincing.

In our view, the lack of credibility stems not only from the "recovery" learning curve methodology, but also from the use of the 92 percent learning curve itself. These deficiencies alone would preclude recovery. Mr. Nelvin Gee, who performed the pricing analysis for common shops, acknowledged during cross-examination that in determining the 92 percent recovery curve the consultants did not analyze historical disruptions in the

common shops and calculate the learning rate. He also acknowledged that the curve projects a performance better than ever achieved in Lot 17 and testified that he had not seen any historical performance that would suggest that it was "either a good projection or a bad projection." (Tr. 18/82-84) Moreover, as our findings indicate, we were not persuaded in any event that the Government should bear the responsibility for the bond shop shut down. Rohr is not entitled to recover for the common shops element of its claim.

Direct Services Labor

Services labor at Rohr consists of non-touch labor support functions. Each services labor category is assigned a function code. Services labor charges may be either direct or allocated within the same function code, depending upon the tasks or functions the personnel are performing. (Gillach, tr. 17/21-22; ex. A-520) We deal first with the direct services labor. The specific function codes assigned to the different services labor categories involved in the direct services portion of the claim are: FC-95 quality assurance; FC-94 corrective action board; FC-73 manufacturing engineering; FC-91 production engineering; FC-92 engineering release; FC-93 industrial engineering; FC-24 processing; and FC-66 tool maintenance. Some of the function codes are located in and involve Chula Vista even though the parts are used in Riverside. (Hubbard, tr. 16/102-03; Gillach, tr. 17/14; ex. A-494 at 3-6, ex. A-520) Direct services labor consists of labor hours charged directly to a specific program, such as the F-14 program, within a services labor function code.

It is in the direct services labor area that the impact of DCAS-Santa Ana's changes would be expected to be and is the most visible. Rohr claims $7,017,333 in costs for this element. As a general matter, the data developed by Rohr's consultants shows that direct services labor hours on the F-14 program had been relatively steady during 1985, 1986 and 1987, but then increased significantly in almost all function codes in 1988, 1989 and into 1990. (Gillach, tr. 17/15; exs. A-526 through -542)

Rohr's consultants assembled assessment teams of knowledgeable Rohr personnel for each function. For each function code, the outside consultants developed charts showing full time equivalent (FTE) headcount data for the period 1987 through September 1990. Data taken from Rohr's accounting records was used to create the function code charts. FTE data for 1987 was used to establish a baseline. The FTE data for 1988 through 1990 was broken into five periods: four six-month periods commencing 1 January 1988; and a final period beginning "After December 1989" and concluding, in most instances, 31 October 1990 (ex. A-554 at 4). The FTE differential for each period was multiplied by the hours in the period. Labor and overhead rates were applied to the product. A final "lot adjustment" factor was applied to insure that only Lots 18 through 21 costs were involved. A learning curve application was not used in pricing the direct services labor because the tasks were considered less repetitive than either major assembly or common shops, although some learning potential was acknowledged. (Fuener, tr. 15/191; Gillach, tr. 17/18-19, 23-27; ex. A-519)

In January 1990, Rohr's consultants held an initial meeting with representatives of each services labor function codes. The consultants then held a separate meeting with each Rohr function code team. The participants were each given an FTE headcount chart for their function code. They were asked to explain why growth in FTE head counts or labor hours had occurred during 1988, 1989 and 1990 in comparison to 1987. A second meeting was held in December 1990 with most of the function code assessment teams. Declarations were prepared for each function code memorializing the teams' rationale and attested to by the assessment team participants. The declarations are part of the record. (Fuener, tr. 15/194-97, 204-205; Gillach, tr. 17/27-30; exs. A-495, -514 through -518, -530 through -542) Many of Rohr's declarants also testified at the hearing. (Reed, tr. 8/106-09, 168-69; Lounsbury, tr. 9/57-58; Luksza, tr. 10/160-62; Thompson, tr. 10/254-56; T. Perez, tr. 11/90-91; Hammond, tr. 14/121-23)

The assessment teams analyzed the performance data and determined the portion of the manpower increases attributable to the DCAS-Santa Ana changes. Though the Government suggests non-DCAS causes were ignored, Mr. Gillach's testimony makes clear that impacts unrelated to DCAS actions were not ignored. As he testified, they were interested in knowing if there was "something due to Rohr, something due to Grumman, or something due to . . . changes in past practices with DCAS." They "did not focus solely on DCAS. We focused on the overall, what had happened in each function code." (Gillach, tr. 17/20, 61) We found his testimony persuasive. Moreover, this approach is also evident in the assessments themselves, particularly where the teams did not assign all of the FTE increases to DCAS-related causes.

Using FC-73 manufacturing engineering and FC-95 quality assurance, as examples, the assessment teams traced the need for additional people to specific DCAS-Santa Ana causes, such as: (1) the need to track and stay current with DCAS actions; (2) DCAS-Santa Ana's refusal to accept "employee error" as an adequate statement of cause and corrective action; (3) DCAS-Santa Ana's rejection of "use as is" as a standard repair; (4) DCAS's intensified scrutiny of planning documentation, and the DCAS requirement for back-up data even when the planning documentation was correct; (5) Rohr's efforts to cope with the "confusion and chaos" caused by DCAS-Santa Ana's daily changes to quality procedures; and (6) Rohr's need to process a vastly increased quantity of QDRs.

Within the direct services labor area, the FC-95 quality assurance and FC-94 corrective action board functions were most directly impacted. We treat these areas first and in so doing deal with the Government's objections to Rohr's approach to measuring damages. The Government does not question that DCAS-Santa Ana's actions had an impact on the resources that Rohr had to commit to its corrective action board and it has conceded impact for those areas in which it has acknowledged DCAS-changes. Nor, in our view, could it reasonably question the same conclusion, which we reach, in connection with FC-95 quality assurance. It argues, however, that Rohr's allocation of costs is inequitable. It has focused

on Rohr's use of baselines and particularly the baselines set for the quality assurance and corrective action board functions.

FC-95 – Quality Assurance

This function code includes all effort expended to service manufacturing tasks. Rohr seeks a total of $1,759,828 for this element of its direct services claim: $1,669,096 for Riverside operations and $90,732 for Chula Vista operations (ex. A-494 at 4).

For the quality assurance function at Riverside, Rohr used 11.1 FTEs, which is an average of the 1987 actual headcount expressed in FTEs, as the baseline against which to measure the impact of the changes in FTEs in 1988, 1989 and 1990. Rohr selected 1987 as the baseline period because this year was closest in time to the impacted years, reflected the same or similar work scope on the F-14A+ model, and incorporated the start-up disruptions that Rohr had experienced on the F-14A+ model. By using 1987 as the baseline, Rohr believed the non-DCAS impacts would be below the baseline and therefore would not affect the pricing of the claim. (Fuener, tr. 15/192-93; Gillach, tr. 17/24-26)

The Government objects to Rohr's approach for two principal reasons. First, it questions the basic approach. It points out that Rohr normally proposes direct services hours as a ratio of base production hours (R4, tab 381). It agrees with this approach because it believes the two variables have a direct relationship to each other and that direct services labor "supports" the base production hours. (Gov't. br. at 130-31) The Government faults Rohr for departing from its proposal pricing approach in pricing the direct services labor portion of the claim. We do not; although we do not ignore the relationship. Rohr chose the approach it did to provide a more accurate assessment of the impact to direct services labor and to insure that non-DCAS causes were taken into account. We examine the proof on its merits.

The Government's second objection focuses on the same factors that prompted Rohr to select 1987. However, the Government reaches the conclusion that 1987 is not a good baseline, although it has not proposed an alternative. In the Government's view, F-14 production was just starting up in 1987, especially in major assembly, after the break in production in 1986 for the change to the A+ model. Work in process had not reached a full level during 1987. The Government emphasizes in this regard that base production hours were significantly less at Rohr Riverside in 1987 than in 1988 or 1989. The Government identifies Riverside's direct hours for function codes 11 through 19, fabrication through major assembly, as totaling 212,025 hours in 1987 compared to 291,993 hours in 1988, and 254,116 in 1989. (Ex. G-88 at 19, 45, exs. -50,-55; Govt. br. at 172) Moreover, Rohr's Riverside plant had fewer base production FTEs for the first six months of 1987, than the second six months during which base production hours increased. Though some minor errors were identified in the data for December 1987 and January 1988 in FC-18, major assembly, the basic point remains.

We think there is merit in the Government's objection, although we conclude that 1987 is the appropriate year to use in setting the baseline. The use of an average for the year in calculating the baseline FTEs is unreasonable because it understates or minimizes the start-up problems and other non-DCAS caused problems, which both Rohr and the Government agree must be accounted for. There is, perhaps, no one best way to set the baseline. However, on balance and considering the evidence of record, we think it's reasonable to look to a last quarter of 1987 average of the FTEs as the baseline, as opposed, for example to the October 1987 FTEs as a baseline. This approach recognizes substantial production and looks past start-up issues, while requiring Rohr to bear a greater share of the costs in recognition of its own responsibility. It is also the last period that can be said to be reasonably free of DCAS-Santa Ana influence. We appreciate that although DCAS-Santa Ana did not assume formal responsibility until January 1988, DCAS-Santa Ana loaned Mr. Rumell to DCAS-San Diego on or about 5 October 1987. There is evidence, of course, that he made his presence known in November and December, if not late October. However, until the formal transfer took place, Mr. Rumell did not have the same freedom of action since he was subject to Mr. Dunkel's direction.

Consequently, we have set the baseline for the quality assurance function based on the average FTE headcount for October, November and December 1987. We have also followed this practice in evaluating the other categories unless otherwise indicated. Moreover, since the period hours, Rohr's labor and overhead rates and the lot adjustment factor are not in question, we have applied these factors in making our computations. However, we have made two other basic adjustments which are discussed below in context.

For FC-95 quality assurance at Riverside, the average 1987 last quarter FTEs were 14.58 FTEs (ex. G-88 at 19) instead of the 11.14 FTEs that Rohr used as its claim baseline (ex. A-495 at 335). The average FTEs for period one (January through June 1988) was 14.61. For period one, the change from the 1987 baseline is an increase of .03 FTE instead of 3.47 FTEs claimed. Since the entire FTE increase is attributed to DCAS-related causes, the application of the labor and overhead rates, and the .95 lot factor yields a recovery of $1159 instead of the $134,477 claimed for the period.

For periods two through five, however, Rohr attributed less than the full difference between the baseline hours and the period hours to DCAS-related causes in order to recognize non-DCAS-related causes of FTE increases. For example in period two, the average FTEs were 23.29 and the change from 1987 was 12.15 FTEs (based on Rohr's 11.14 FTEs baseline). Rohr's evaluation attributed 10.94 FTEs to DCAS. In this situation an adjustment is necessary in order to maintain Rohr's allocation of responsibility to itself. Accordingly, we have reduced the FTEs attributed to DCAS under our methodology by 1.21 FTEs, the difference between the 12.15 FTEs for the period and the 10.94 FTEs attributed to DCAS by Rohr. Thus, for period two, the difference between our 14.58 FTEs baseline and the period FTEs 23.29 is 8.71 FTEs from which we subtract 1.21 FTEs, resulting in 7.50

FTEs for the period. When the period hours, labor, overhead and lot factors are applied to the 7.50 FTEs attributable to DCAS, the result is a recovery of $282,727 in lieu of the $411,542 claimed. Applying the same methodology to periods three and four results in a recovery of $399,386 based on 10.62 FTEs and $137,946 based on 5.54 FTEs, respectively, for the periods, as opposed to the $529,906 and $265,008 claimed.

The second adjustment is in connection with the final period, "After December 1989." This period is computed from 1 January 1990 to 31 October 1990 (ex. A-554). However, our assessment of the evidence convinces us that the appropriate time to cut-off recognition of DCAS impacts is 1 July 1990, when the Operating Guidelines were put into place. Consequently, we recognize the costs for the first 6 months of the 10-month period and base Rohr's award on 60 percent of the DCAS-attributable hours for the period. Our methodology yields 4.59 FTEs or 7747.92 DCAS-attributable hours for the period, 60 percent of which is 4,648.75 hours. When the appropriate factors are applied, Rohr is entitled to $111,499 instead of the $328,324 claimed for this period.

Of the $1,669,096 claimed by Rohr for the quality assurance function at Riverside, Rohr is entitled to $932,717.

Rohr claims $90,732 for quality assurance at Chula Vista (ex. A-495 at 336, ex. A-531). It has attributed one FTE to DCAS during periods one and two and .33 FTE for periods three and four. No claim has been made for the post-December 1989 period. Our baseline average is 8.05 FTEs (ex. G-88 at 17). For periods one through four the increases over our baseline are .40, 2.63, 3.38 and .98. Rohr's allocation of responsibility to itself for period two through four was .28, 2.51, 3.93, and 1.53 FTEs, respectively. Once the baselines are adjusted to maintain Rohr's allocation of responsibility, the FTEs attributable to DCAS for periods one through four are .12, .12, -0.55, and -0.55, respectively. Rohr is entitled to recover $9,022 for periods one and two.

In summary, Rohr is entitled to a total of $941,739 for the FC-95 quality assurance element of its claim.

FC-94 Corrective Action Board

This function code covers the labor performed for corrective action board activities. Rohr claims $1,486,205 for this element: $1,394,063 for Riverside activities; and $92,142 for Chula Vista (ex. A-495 at 535-36, exs. A-532, -533). Our average FTEs for 1987 were 1.36 FTEs at Riverside (G-88 at 19) and 1.14 FTEs at Chula Vista (G-88 at 17). Rohr proposed an FTE baseline of .33 at Riverside as opposed to the 1.36 we have adopted. In addition to the reasons initially prompting us to select the average baseline we did, we are not persuaded that the record supports assigning responsibility to DCAS for actions in June 1987 as the .33 baseline does. (Ex. A-532 at 3-4)

The number of FTEs increased at Riverside to over 7 at the end of 1988 to a high of almost 13 at the end of 1989 before declining to an average of 7.76 during the last period (ex. A-532 at 11). The change from our average baseline in the first four periods is -0.07, 6.09, 11.53, and 6.71 FTEs, respectively. In each instance Rohr would attribute all of the increase (or more, but for our baseline adjustment) to DCAS. Since we agree with the allocation as adjusted, Rohr is entitled to $943,059 for periods two through four, with no recovery for period one. In the fifth period, Rohr increased the baseline by .67 to account for several non-DCAS-related changes (ex. A-532 at 8). We have added this increase to our baseline for a total of 2.03 FTEs which ultimately results in a 5.73 differential. We have also adjusted the fifth period costs to recognize only those costs for the first six months of 1990. Rohr is entitled to $146,277 for this period. Rohr is entitled to a total of $1,089,336 for the Riverside corrective action board.

The increases at Chula Vista were more moderate. The increases over our 1.14 FTEs baseline in the first three periods were .64, 1.05 and .39, respectively. No claim is made for periods four and five. (Ex. A-534) Based on our review of the record, Rohr is entitled to recovery for the increases over the baseline. We award Rohr $73,852.

In summary, Rohr is entitled to a total of $1,163,188 for FC-95 corrective action board.

FC-73 Manufacturing Engineering

This function code involves the tool planning, liaison and maintenance required in the production effort. Rohr claims a total of $784,303: $709,668 for Riverside operations and $74,635 for Chula Vista operations. (Ex. A-495 at 335-36, exs. A-538, -539)

Our baseline at Riverside is 7.17 FTEs (G-88 at 19) as opposed to Rohr's 5.79 baseline. The FTEs for the manufacturing category during periods one through five were 8.36, 10.52, 9.66, 9.98, and 11.75, respectively. The increases over our baseline average in each period were 1.19, 3.35, 2.49, 2.81, and 4.58 FTEs. The FTEs not attributed to DCAS in each period were 1.07, .87, .58, .63, and .89. Adjusting our baseline to account for the FTEs not attributed to DCAS results in a revised increase over our baseline of .12, 2.48, 1.91, 2.18, and 3.69 for periods one through five, respectively. We apply the FTE increases in each period over our baseline in determining Rohr's quantum. We adjust the fifth period recovery to recognize costs only for the first six months. Our calculations result in a recovery for Rohr, by period, of $4,902, $96,314, $77,305, $86,443, and $96,857, for a total of $361,821.

At Chula Vista, Rohr claims $74,635 for costs incurred during periods one and two. No claim is made for the remaining periods since the FTEs in those periods were less than Rohr's baseline of 3.23 FTEs. The increase in the period one FTEs over Rohr's baseline was .98. In period two, the FTEs were -0.23 less than the baseline, a decline of 1.21 FTEs from

the period one FTEs. Our average baseline is 3.42 FTEs (ex. G-88 at 17), which results in a period one increase over the baseline of .79 FTE. In the second period the FTEs were -0.42 less than the baseline. Rohr's assessment team noted the "slight increase" in period one hours. It concluded that the decrease in hours during period two was reasonable since the hours would be expected to decline gradually as the disruption caused by the changeover from the A to the A+ model lessened and Rohr's employees became more accustomed to the configuration. In each period, however, Rohr attributed 1 FTE to DCAS to account for "the need to rewrite the planning each time a specification was changed." (Ex. A-539)

We are not persuaded by the conclusory nature of Rohr's evidence in the face of our baseline analysis, particularly the failure to explain the interrelationship between the decline in FTEs and the rewrite workload. Rohr has not met its burden of proof for this element.

In summary, Rohr is entitled to $361,821 for the FC-73 manufacturing engineering category.

FC-91 Production Engineering and Engineering Liaison

This function code involves the labor expended in providing direct engineering services in support of production departments. The production engineering department experienced a doubling of its labor hours during the period July 1988 through 1990 from approximately 4.6 FTEs to more than ten FTEs. Messrs. Tony Reed and Robert Thompson testified at the hearing that the increase in labor hours was due to DCAS-Santa Ana actions, such as: (1) refusal to allow Rohr to ship parts with "open" corrective action, which required Rohr engineers to work additional hours to expedite the shipment of the hardware; (2) increasing Rohr's MRB activity and requiring elaborate and time-consuming research on discrepancies; and (3) changing the inspection procedures for paint primer thickness, which required Rohr to purchase and use isoscopes with readout capabilities. (Ex. A-537, at ¶¶ 8, 9, 10)

Rohr claims a total of $754,455: $668,866 for Riverside operations, and $85,589 for Chula Vista operations. (Ex. A-495 at 335-36, exs. A-536, -537) Rohr makes no claim at Riverside for the first period where the FTEs were 3.31 due to the transfer out of the department of one staff member. The assessment team found that FC-91 felt no direct or indirect impact from any DCAS changes during the period. However, all of the FTE increases over the baseline in periods two through five were assigned to DCAS. We agree with the assessment. Our Riverside baseline is 4.68 FTEs (ex. G-88 at 19) as opposed to Rohr's 4.66 FTEs baseline. Based on our methodology Rohr is entitled to a recovery of $75,301 for period two, $120,766 for period three, $197,208 for period four, and $151,946 for period five, for a total recovery of $545,221.

The Chula Vista element of Rohr's claim is confined to periods three, four and five using a baseline of 5.4 FTEs. The only period in which there was an increase is the fifth

period. Our baseline is 5.34 FTEs. In periods one through five, the differences between the period FTEs and our baseline were .29, -1.30, -0.40, -1.34, and .47. The assessment team considered the decrease from the baseline during the period reasonable on the basis that labor hours would be expected to decline gradually as the disruption caused by the A to A+ changeover lessened and Rohr's personnel became more accustomed to the A+. No service labor hours were identified as attributable to DCAS during the first two periods.

The labor hours increased by .90 FTE between period two and three. The increase was attributed to the arrival of a new DCAS inspector, Mr. Lewis, who began to alter the inspection practices and documentation requirements established by his predecessor. The team assigned 1.5 FTEs to DCAS during this period with the understanding that service labor hours would have continued to decline, but for the inspector's arrival. This same approach was followed in connection with period four where the FTEs for the period decreased by .94 FTE over the previous period and was less than the period two FTE by .04. One FTE was claimed for this period.

We are not prepared to accept the team's generalized analysis and assignment of responsibility to DCAS in periods three and four. Moreover, we are not able to understand the relationship between the assignment of responsibility to the expected improvement in performance that it is claimed would have occurred but for DCAS's changes. Instead, we believe recovery should be limited to the FTE increase over our baseline. Since there were no baseline increases in periods three and four, no recovery is warranted.

In the fifth period, the FTEs increased over the fourth period by 1.81 FTEs and .47 FTE over our baseline. One FTE was attributed to DCAS actions during the months of January and February 1990 when DCAS refused to recognize a Grumman approved change in the inspection technique for the welded plenum from a penetrant inspection to a visual procedure and refused to accept withhold tags until the formal paper work could be changed. It is also claimed that an additional work load was incurred during these months in securing hardware release. For the months of March through 1 October 1990, .25 FTE was attributed to DCAS. Overall Rohr claims .39 FTE for this period. We accept Rohr's uncontroverted evidence for this period. Based on our adjustments, Rohr is entitled to $7,078 for FC-91 at Chula Vista.

In summary, Rohr is entitled to $552,299 for FC-91 production engineering and engineering liaison.

FC-92 Engineering Data Release (Chula Vista)

This function code involves releasing engineering data into the system. Rohr claims $117,389 for Chula Vista operations (ex. A-494 at 4) However, its proffer indicates a claim value of $99,487 (ex. A-495 at 336). Rohr's claim analysis (ex. A-535) depends on a baseline of 1.56 FTEs. Application of our average baseline of 2 FTEs eliminates the claim.

Rohr seeks recognition of 1 FTE for each period except the last, although its own analysis shows baseline differences of -.42, .53, .38 and -.58. There is evidence that Rohr added an engineering release analyst in late 1987 to respond to a new DCAS requirement that all engineering releases have NAVPRO signatures. However, we are not persuaded in light of the uncertainty of the overall analysis. No recovery is allowed for this item.

FC-93 Industrial Engineering (Riverside)

This function code involves the maintenance of standards, layout preparation and industrial engineering services applied directly to production tasks. Rohr's claim is $143,463 for Riverside operations (ex. A-495 at 335). Our average baseline is 3.57 FTEs (ex. G-88 at 19). The difference between our baseline and Rohr's 2.28 baseline is 1.29 FTEs and when our baseline is compared to the average FTEs for period one, there is a -.04 FTE decrease. Rohr has claimed .25 FTEs for this period. This allocation is based on a percentage Rohr computed on the difference between its baseline and the average FTEs for the period. Rohr is entitled to no recovery for this period in view of the decline. For periods two and three the increases over our baseline were 1.73 FTEs and 1.08. For periods two and three, Rohr attributed 1.30 and 1.20 FTEs to DCAS causes, respectively. For period two, Rohr's assessment was based on a comparison of the growth between the base period and period one and period one and period two and the assignment of a percentage of the growth in each period to DCAS. Under the circumstances we believe this approach is reasonable and we follow the same methodology using our base period. Since there was a decline in the FTEs between the base period and period one, we do not apply this component of Rohr's analysis. Rohr attributed 70 percent of the difference between period one and period two to DCAS. The difference between using our baseline for period one and period two is an increase of 1.73 FTEs and we base Rohr's recovery on 70 percent of the increase. We award Rohr $46,612 for this period.

In period three, the average FTEs were 4.65, lower by .65 FTE than they were in period two. The assessment team considered the situation in period three to be essentially the same as period two despite the .65 FTE decline and assigned 1.20 FTEs to DCAS. The difference between our 3.57 FTEs baseline and the period three 4.65 FTEs is 1.08 FTEs; 70 percent of 1.08 is .76 FTE, which we determine is the limit of Rohr's recovery for period three. Rohr is entitled to $29,848. However, in periods four and five the FTE averages were 3.48 and 3.42, respectively, both of which are less than our average baseline. No recovery is warranted for these periods.

Rohr is entitled to a total of $76,460 for FC-73 industrial engineering (Riverside).

FC-24 Processing

This function code involves painting, degreasing operations, and other similar operations. It encompasses three departments: Big paint shop, small paint shop and the

processing area. Rohr claims a total of $1,593,742: $878,950 for Riverside operations; and $714,792 for Chula Vista operations (ex. A-495 at 335-36). The Riverside claim encompasses only the big paint shop; at Chula Vista it includes the big paint and small paint shops and processing.

At Riverside, the two-member assessment team (a manufacturing process specialist and a "P.C." area control official) attributed 100 percent of the increase in hours above the baseline to DCAS because of the numerous changes it implemented or inspired in painting procedures, inspection requirements, and paper work support during periods one through four. It was the team's belief that the labor hour level experienced in the baseline period would have been constant throughout, but for DCAS actions. On this basis the assessment team assigned cost responsibility to DCAS in every period. The team members did not testify; however, the testimony and evidence presented at the hearing traced awareness, if not the beginning, of the problem to December 1988. And, the testimony focused on Rohr's responses to a Grumman SCAR dealing with paint problems on shipsets shipped to Grumman at the end of November 1988. Without the benefit of further elaboration from the declarants, we are not persuaded that Rohr has presented a basis for recovery in periods one and two. Instead, we confine ourselves to the impact from period three (1 January 1989 through 30 June 1989) forward. Moreover, we have limited the consideration of the period five costs to the first six months of 1990. In this respect, Rohr's director of engineering acknowledged that the problem was resolved with the Operating Guidelines. (Ex. A-541)

More importantly, we believe Rohr's baseline must be adjusted. Rohr's baseline for the big paint shop component of FC-24 is 695.33 hours (exs. A-495 at 335, -541). This baseline is derived from the experience in 1987. We believe a departure from our general approach is warranted here. In our view, the baseline should be based on the average hours experienced in 1988. This baseline fits better with the evidence presented, while recognizing Rohr's own problems in the area. (See our discussion of the problems which surfaced at the end of 1988 in connection with Change 10.) Consequently, we use the average of 1,609.25 hours for the two periods in 1988 as our baseline (ex. A-541).

The average hours in the third period were 2,106.50, an increase of 497.25 hours over the baseline. We attribute this increase to DCAS. Rohr is entitled to $105,884.

After April of 1989 the monthly hours began to decline from approximately 2500 in April to between 1,400 and 1,500 in July. In period four (1 July 1989 through December 1989) the average hours declined to 765.50, well below our baseline. Rohr is entitled to no recovery for period four.

In period five (1 January 1990 through October 1990), the labor hours rose significantly from the prior period. The average hours for the period were 1638.10, an 872.60 hour increase over the previous period. The assessment team estimated that 80 percent to 85 percent of the increase above the baseline level of 695.33 should be attributed

to DCAS. The team attributed the increase to a combination of the increased inspection criteria imposed by DCAS and the inefficiencies caused by the bond shop shut down. The declarants do not explain why the hours were so low in period four if the changed inspection criteria played as large a role as claimed in period five. Finally, Rohr's evidence shows the problem was solved in July 1990 (tr. 10/249), when the Operating Guidelines went into effect, and the claim must be adjusted to reflected the shorter period. We are left then with the explanation that the effects of the bond shop shut down the previous August accounted for the increase. The assessment team members base this assignment of responsibility on the assumption that DCAS is responsible for the shut down and, consequently, the costs claimed here. Our conclusion, as previously indicated, is that responsibility is not to be assigned to DCAS.

Under the circumstances, Rohr's evidence in support of recovery in the fifth period is not persuasive. This element of its claim is denied.

Rohr is entitled $105,884 for the big paint shop processing category at Riverside.

At Chula Vista, Rohr's claim is for $714,792 (exs. A-495 at 336, -542). The declarations of the two-member assessment team assert in conclusory terms that the "primary cause" for the increase in labor hours was directly attributable to a GAC (Grumman) inspector, Mr. Fred Bizak, who arrived in Chula Vista in 1988 after having spent the previous several years at Rohr's Riverside plant. The declarations do not say when in 1988 he arrived, but express the belief that his behavior was the direct result of his prior experience at Riverside where he witnessed DCAS impose numerous new inspection criteria. It "appeared" that when he transferred to Chula Vista, he was "imposing similar new inspection criteria." The team claimed that the "new inspection criteria significantly altered and disrupted the long established paint and processing procedures which in turn caused a dramatic increase in the labor hours. The team believed that the inspector's changes to established post inspection practices [were] directly the result of DCAS's influence on him during his tenure at Rohr's Riverside facility." The team cited an increase in what constituted an "acceptable" level of paint quality, unreasonable paperwork requirements, failure to provide timely inspection support, and his use of isoscopes in measuring paint thickness. The examples, however are not helpful. They lack specificity and are tied generally to a two-year period between 1988 and 1990. (Ex. A-542) There is no discussion of specification requirements or the Grumman inspector's role in relationship to DCAS procedures at Chula Vista. Moreover, the assessment team assigned all of the increase in FTEs over the baseline to DCAS-causes, without any attempt to differentiate among the periods. Without the benefit of testimony to provide specificity, the team's assessment is simply too general to base either a favorable causality determination or a monetary assignment of responsibility. Rohr has failed to meet its burden of proof.

In summary, Rohr is entitled to $105,884 for FC-24 processing.

FC-66 Tool Maintenance Plant (Riverside)

This function code represents labor expended in the maintenance and repair of the contract tools and charged to a tool. Unlike the other function codes, this represents a task rather than a summary of department and cost center labor. Rohr claims $378,944. (Ex. A-495 at 535, ex. A-540) The six-member assessment team was composed of the mechanical engineers who actually initiated the tool orders, but charged their time to FC-73 manufacturing engineering, because the personnel in FC-66 simply executed the tool repair order but were unaware of the root cause for the error. The assumption was made that the labor hours for FC-66 spent maintaining the tools increased or decreased in direct proportion to any increase or decrease in the number of tool maintenance orders written by the mechanical engineers.

Rohr makes no claim for period one. During period two (1 July 1988 to 31 December 1988), the team determined that 75 percent of the increase in tool maintenance orders was the result of the change in DCAS's acceptance criteria for corrective action and, therefore, 75 percent of the tool maintenance hours should be attributed to DCAS. Rohr claims $66,706 for this period. The period three (1 January to 30 June 1989) hours rose slightly in comparison to the period two hours. Seventy-five percent of the increased in hours over the baseline was attributed to DCAS and $77,046 is claimed (ex. A-540). For period four (1 July 1989 through December 1989) the team "once again determined that 75% of the increase in tool maintenance labor hours . . . should be attributed to DCAS based on the fact that it changed its acceptance criteria for Rohr's corrective action practice." The claim for this period is $74,558. (Ex. A-540)

The period five (1 January 1990 through September 1990) claim was again based on the additional tool maintenance labor which was incurred because of DCAS's change to Rohr's corrective action practices and seeks $160,633 (ex. A-496 at 335). Several adjustments were made to take into account three events that influenced the increase in labor hours during the period that were not attributable to DCAS. To compensate, Rohr "estimated" that the function would have experienced an average labor hour level in period five roughly equal to an average of the hours at the very beginning and at the very end of the period – an average of "approximately" 12.5 FTEs. The team attributed 75 percent of the 3.12 FTE difference between 12.5 FTEs and the 9.38 FTEs experienced in period one to DCAS. If 75 percent of the hours are attributed to DCAS, the result is a claim of approximately $81,400 as opposed to the $160,633 claimed. This discrepancy is not explained.

The claim for this function code is based on an assumption of a relationship between the orders issued and the work load of the function. It also asserts broadly that DCAS is responsible for 75 percent of the activity, with little or no detail. The only period where non-DCAS contributors to work load increase are discussed is in the evaluation of the fifth period work hours. And, the evaluation provides no practical way for assessing the

reasonableness of the allocation. Without greater visibility into the investigatory base that prompted the assessment team's evaluation, we are unable to accept broad general assessments and allocations of responsibility as a predicate to a quantum award. Rohr has not carried its burden of proof for the element.

Allocated Services Labor

As indicated services labor charges may be either direct or allocated within the same function code, depending upon the tasks or functions the personnel are performing. In contrast to direct services labor, allocated services labor consists of labor hours charged to a pool account when Rohr's personnel are working on a number of different parts or programs simultaneously. The time charged to a pool account is then allocated to individual programs — in this case the F-14 program — based upon the percentage of direct labor costs on the program to the overall labor costs of the company. (Gillach, tr. 17/21-22; ex. A-520) The allocated services labor portion of Rohr's claim is $2,353,838.

Allocated services labor at Rohr consists of the same categories of non-touch labor as described above for direct services labor. However, a claim has not been submitted for every category and the categories claimed are not identical. Claim is made for the following categories: FC-24, -28, -29, -66, -73, -91, -92, -93, -94, and -95. Under Rohr's methodology FC-66 Tool Maintenance at Chula Vista is identified as a category but no hours are claimed, although $13 is claimed for this category at Chula Vista. The FC-92 engineering data release category at Chula Vista is identified and $30 claimed, but no percentage is attributed to DCAS. Based on our adjustments, we conclude that no recovery for the FC-66 and FC-92 categories is warranted.

The Government does not question Rohr's method for calculating allocated services labor. It does, however, take exception to the base hours to which the allocated services factor is applied. (Gov't br. at 130) We accept Rohr's methodology with the following adjustments. Rohr determined the total F-14 production hours (major assembly and common shop hours) from January 1988 to October 1990, arriving at a total of 1,355,083 hours. Since we have concluded that recognition of costs after the end of June 1990 is not warranted, we have adjusted the total by subtracting 147,853 hours as representing the hours incurred from July to October 1990, for a revised total of 1,207,230 hours. (Ex. A-494 at 1-3) Rohr then determined the number of services labor hours allocated to the F-14 program for each Riverside and Chula Vista function code from January 1988 to October 1990 (ex. A-495 at 2-3). We have made a similar adjustment in the case of the function code allocations by subtracting three months' worth of hours from the last period. We then divided, as Rohr did, but with our numbers, the F-14 allocated services hours for each function code category by the total F-14 production hours to obtain the percentage of service hours to production hours for each function code.[5] We then multiplied the percentage for each category by the 43,765 major assembly hours we found Rohr entitled to recover (as opposed to 277,667 hours for major assembly and common shops that Rohr had claimed and

used in its calculations) to determine the number of labor hours for each function code category attributable to DCAS-Santa Ana changes. Finally, we applied the average period labor and overhead rates for each category to the hours attributed to arrive at our award for the allocated services labor portion of Rohr's claim. (Ex. A-494 at 5-7, columns 6, 8 (schedules), tabs 1-3, 2-3, 3-3, 5-3)

Based on our adjustments and calculations, Rohr is entitled to the following amounts for the respective function codes: FC-24 processing (Riverside and Chula Vista) – $26,736; FC-28 production control (Riverside and Chula Vista) – $29,440; FC-29 manufacturing support (Riverside and Chula Vista) – $50,924; FC-73 manufacturing engineering (Riverside and Chula Vista) – $34,876; FC-91 production engineering – $2,078 (Riverside and Chula Vista); FC-93 industrial engineering (Riverside and Chula Vista) – $22,745; FC-94 corrective action board (Riverside and Chula Vista) – $28,906; and FC-95 quality assurance (Riverside and Chula Vista) – $182,368. In summary, Rohr is entitled to a total of $378,073 for this element of its claim.

Special Teams Costs

We turn next to the special teams costs. Rohr claims $2,486,881 for the costs of five special teams that were formed in response to the changes and disruptions caused by DCAS-Santa Ana: (1) the planning audit team – $371,901; (2) the planning rewrite team – $947,785; (3) the process compliance audit team – $389,101; (4) the process impact team – $576,993; and (5) the throughput improvement team – $201,101. The special teams portion of the claim includes only those activities that occurred under Rohr's F-14 purchase orders with Grumman, and only those costs which Rohr says are attributable to actions of DCAS-Santa Ana. Reductions have been made to the charges of the planning audit team and the planning rewrite team for either non-F-14 or non-DCAS related activities. (Gillach, tr. 17/40-41; ex. A-494 at 10; ex. A-495 at 358-62; ex. A-546) The rates, hours charged, and calculations are not in dispute.

The Government says the costs of the five teams should be charged to Rohr and not the Government. Rohr formed each of the teams on its own initiative and any and all benefits inured to Rohr. Rohr has not established that the Government caused it to create the teams nor has it given credit for any benefits to its commercial programs. We address the Government's contentions in the context of assessing the special team costs claimed.

Planning Audit Team

Rohr formed the planning audit team in November 1988 and it became a full time operation in the February to March 1989 time frame. This team was formed in response to DCAS-Santa Ana criticisms that deficiencies existed in Rohr's planning documentation. This team focused on responding to DCAS-Santa Ana requests for "objective evidence." The team ultimately consisted of approximately 12 to 18 Rohr quality engineers and manufacturing

engineers who reported to the Rohr Riverside quality manager. (Hammond, tr. 13/228-31; D. Wilson, tr. 15/19-20; ex. A-547 at 46-47)

The planning audit team reviewed individual ASOs to investigate why DCAS-Santa Ana was rejecting hardware for an alleged lack of objective evidence or supporting documentation. This team attempted to reconstruct as much information as possible from other sources within Rohr, such as from oven logs and other floor control documentation. DCAS-Santa Ana would not permit shipment of hardware until this effort in supplementing the ASOs was completed. In the February to March 1989 period, as the DCAS-Santa Ana requests for supporting data became more frequent and broader in scope, the planning audit team became a full-time audit group. (Hammond, tr. 13/233-37; Lukaza, tr. 10/109-13)

The Government says that Rohr formed the planning audit team on its own to correct customer complaints with its planning documentation. As our findings show, we acknowledge that DCAS did not "order" Rohr to create any of the special teams. However, we are persuaded that but for DCAS-Santa Ana's actions, this team would not have been necessary and would not have been formed. Nevertheless, we believe it is unreasonable to assign the total cost of the team's efforts to DCAS in view of Rohr's own contributions to the planning deficiencies. (See in this respect our discussion in connection with Change 9.) Under the circumstances we believe a fair and reasonable assessment of Rohr's responsibility can be arrived at by following the same approach we did in adjusting Rohr's recovery in connection with the inlet and glove element of major assembly and assigning responsibility for 23.8 percent of the costs to Rohr. Consequently, we limit Rohr's recovery to 76.2 percent of the $371,901 claimed. Rohr is entitled to $283,389 for this element of its claim.

Planning Rewrite Team

In November 1988, the planning rewrite team was established to revise the planning documentation on Rohr's military programs. (Roadick, tr. 4/72, 73; ex. A-150) This team was formed shortly after the creation of the planning audit team, when Rohr separated the tasks of supplementing the existing hardware planning (a short-term solution), and of revising the planning (a long-term solution). (Susil, tr. 8/189; ex. A-150)

The Government says that the planning rewrite team is in the same category as the planning audit team and for the same reasons we rejected the Government's argument in connection with the planning audit team, we do so here. We think formation of the team was a reasonable response to DCAS-Santa Ana's actions. However, for the same reasons discussed in connection with the planning audit team, we limit Rohr's recovery to 76.2 percent of the $947,785 claimed. Rohr is entitled to recover $722,212.

Process Compliance Audit Team

Rohr established the process compliance audit team to audit the paperwork for the 1,000 work in process bond panels following the 1 August 1989 Bond Shop shutdown.

As our decision on entitlement shows, Rohr has not persuaded us that the Government should bear the responsibility for these costs.

Process Impact Team

The process impact team was formed to analyze potential methods of reducing the number of nonconformances and associated MRB activity in Rohr's F-14 production. This team was first known as the "DCAS Impact Team," but its name was changed when meetings were held with Grumman and DCAS representatives. (Roadick, tr. 4/92-94) The process impact team originated in April or May 1989, and consisted of ten Rohr and two contract employees (Roadick, tr. 4/92; ex. A-547 at 43).

The process impact team identified approximately 30 different items that accounted for much of Rohr's F-14 MRB activity, and developed proposed methods for reducing or eliminating the nonconformances. This team prepared three work products that were furnished to Grumman. The team's proposals, known as corrective action memoranda, involved extensive tooling and equipment changes to Rohr's existing 1969-era technology. (Roadick, tr. 4/95-100; exs. A-253, -260, -266) None of these proposals was implemented due to lack of Navy funding. The tooling and equipment modifications would have required large expenditures and caused schedule impact to the program. Shortly after the process impact team completed its study, the Navy announced that the F-14 program would end with the delivery of Aircraft No. D-37 in 1991. (Llinares, tr. 2/100-02; Roadick, tr. 4/100-01)

The Government has pointed out that this team's recommendations were not implemented. However, the reasons were apparently lack of funding and program termination, not a lack of merit. As our findings show, we believe DCAS certainly contributed to the environment that led to the formation of the various special teams. Our difficulty here is that in contrast, for example, to the work of the planning rewrite team, this team's efforts – as evidenced by its proposals calling for extensive tooling and equipment changes – go beyond what was reasonably required to address DCAS-caused changes. Under the circumstances, Rohr is not entitled to recover for this element.

Throughput Improvement Team

In January 1990, Rohr created the Throughput Improvement Team as a means of improving Rohr's performance to the October 1989 F-14 production schedule. Rohr took this step to avoid jeopardizing Grumman's F-14 aircraft deliveries to the Navy. This team consisted of seven Rohr employees and operated primarily until mid-April 1990, although a

core group remained and picked up additional responsibilities. By mid-April, however, the team had achieved its objectives. This team focused mainly on the Bond Shop to assure that sufficient bond panels were flowing to the F-14 assembly line. The team concentrated on giving priorities to operations or hardware that would expedite Rohr's performance. Although the master schedule was not being met, the needs of the assembly line were met. Rohr was "able to fill the need at the assembly jig." (Gordon, tr. 12/241-42; ex. A-547 at 46) The team also tried to shorten SMRR turnaround time. One of the team leaders testified that Rohr added five days to the schedule to account for processing SMRRs through Grumman. However, what impact the team had on SMRR processing time was never made clear. Moreover, the testimony on the DCAS impacts that were being felt during the time the team was in operation and how the team improved the situation was too general to be helpful. (Gordon, tr. 12/241-43) We note that DCAS had withdrawn from the MRB process during the time the team was performing its effort.

Under the circumstances, we cannot conclude that DCAS's actions were the reason that Rohr formed this team as opposed, for example, to finding ways to insure that it met its commitments to Grumman. We do recognize that but for DCAS-Santa Ana's actions, particularly its withdrawal from MRB participation, the SMRR processing effort would not have been necessary. However, we have no reasonable basis for measuring any contribution the team may have made to the smooth functioning of SMRR processing. We, therefore, deny this element of Rohr's claim.

In summary, we award $1,005,601 for the special teams element of Rohr's claim.

Materials

Rohr claims $1,494,423 for this aspect of its claim: scrap, $319,137; bin stock, $734,675; ti fasteners, $63,798; and freight, $376,813. (Ex. A-550)

Scrap

Rohr claims that DCAS is responsible for $319,137 of the approximately $2,567,580 in scrap costs experienced in the performance of Lots 18 through 21. The consultants' interviews with Rohr personnel indicated that Rohr had been forced to scrap acceptable parts, both large and small, because DCAS would not sign off on the paperwork and Rohr could not afford the delay incident to working through the problem. This led the consultants to assemble scrap data on Rohr's experience on the inlet and glove.

On the inlet and glove, the average scrap cost per unit tripled from $5,145 in Lot 17 to $15,562 in Lot 18. Average scrap costs per unit were $11,160 for Lot 19, $12,196 for Lot 20, and $17,127 for Lot 21. (Ex. A-495 at 368, line 13) Rohr's consultants performed a study of Rohr's scrap tags in an effort to determine what percentage of Rohr's increased scrap costs were attributable to actions of DCAS-Santa Ana. The consultants selected a

sample of 30 scrap tags for 1988 and 31 tags from 1989. Two unidentified Rohr MRB or quality specialists examined the sample tags to determine which of the sample tags were scrapped because of DCAS. For 1988, the team identified two tags, or 6.67 percent of the sample, and valued at $4,312.14 or 1.43 percent of the scrap dollar value of the sample. Six tags, or 19.35 percent, were attributed to DCAS from the 1989 sample. The parts scrapped were valued at $61,913.91 or 32.94 percent of the scrap value of the tags in the sample. No tags were sampled for 1990; instead, the consultants relied on the 32.94 percent value derived from the sample of 1989. These percentages were applied to the total scrap dollars in each of the three years to assign DCAS's responsibility for a share of the total scrap expenses. Adjustments were also made to relate the annual data to the performance periods of Lots 18 through 21, specifically excluding a large amount of pre-1988 costs. (Gillach, tr. 17/43-48, 77-79; ex. A-495 at 368-371; ex. A-522)

In 1995, in an effort to verify the results of the scrap tag study, Rohr Riverside's director of manufacturing sought to reexamine the withhold tags that had been used in the earlier study. However, only 36 of the scrap tags could be found. (Baker, tr. 11/191-93) Mr. Baker reviewed the 36 tags and concluded that 15 of the 36 scrap tags were caused by actions of DCAS-Santa Ana. He felt the results of the earlier study were understated. Mr. Baker cited five specific scrap tags involving parts that DCAS-Santa Ana thought were process violations subject to elevation to Grumman as major nonconformances. In each case, Rohr decided to scrap the part rather than to engage in a debate about the acceptability of the part, although Rohr would ordinarily have considered the parts acceptable. Mr. Baker testified that by scrapping the part, Rohr avoided the delay associated with the SMRR review. He acknowledged, however, that the ultimate decision to scrap a part was Rohr's. Moreover, his analysis consisted of reading the tag and using his judgment as to what happened. He was not personally involved in the decision to scrap any of the tags considered. (Baker, tr. 11/197-209; ex. A-449 at 28, 103, 119, 177, 208)

The Government's DCAA auditor, Mr. Hubbard, also examined the actual inlet and glove scrap material dollars by lot for Lots 15-23. His analysis of the average scrap cost per unit for the lots in dispute produced identical or substantially similar results to Rohr's analysis. His analysis also shows a tripling of costs from Lot 17 to Lot 18. (Ex. G-93 at 2) Mr. Hubbard also looked at scrap costs for Lots 22 and 23, after the Operating Guidelines were in effect and when DCAS disruptions were not an issue. He found that the scrap costs were "very comparable" to what they had been on Lots 19, 20, and 21. The average scrap costs per unit for Lot 22 was $11,220, while the average scrap cost per unit for Lot 23 was $16,147. In his view, if DCAS had been the "driver," the scrap costs should have gone down. (Hubbard, tr. 16/115, 20/60; ex. G-93 at 2)

An examination of the average scrap cost per unit data for Lots 18 through 22 does not by itself suggest that any responsibility should be assigned to DCAS. The data is simply too general. Moreover, we see no benefit in contrasting the Lot 17 experience with the other lots in drawing conclusions about scrap costs during the claim period. Though Rohr's

consultant commented on the increase in costs between Lots 17 and 18 (tr. 17/44), the significance of the change is elusive. The tripling occurs during Lot 18 and can be associated with the A+ model change. Moreover, and more importantly, Lot 18 was almost complete at the time of the change in cognizance. (Ex. G-136) If anything, it seems Lot 18 would be a more appropriate baseline. In any event, we are left with a scrap tag "study" of uncertain methodology, performed by two unidentified Rohr personnel, that reevaluated conscious business decisions to scrap parts, with scant evidence of the role that DCAS may have played in the process. The study is an inadequate foundation for assigning what would be an "estimated" casual responsibility to DCAS and reliance on it would be an invitation to speculation. In this regard, Mr. Baker's analysis must be considered derivative since he was not personally involved in the study or the decisions to scrap the items about which he testified. His opinion does not provide a firmer basis for assigning responsibility to DCAS. This element of Rohr's claim is denied.

Bin Stock and Ti-Fasteners

The total amount of the bin stock and ti fastener portion of Rohr's claim is $798,473. (Ex. A-550) Bin stock and ti fasteners are very small parts that were used in the assembly of Rohr's F-14 components. Ti or titanium fasteners are part of bin stock, but they are more expensive parts and are treated separately in Rohr's accounting system. The costs of bin stock and ti fasteners are allocated to Rohr's programs on the basis of major assembly and subassembly labor hours. The ratio of the F-14 program to Rohr's total program major assembly and subassembly hours is applied to Rohr's cost of bin stock and ti fasteners, and the resulting amount is charged to the F-14 program.

For the inlet and glove, average bin stock and ti fastener costs per unit increased substantially in Lots 18 through 21, in comparison to Lot 17. Average bin stock per unit increased from $9,593 in Lot 17 to $14,643 in Lot 18, $14,936 in Lot 19, $15,959 in Lot 20, and $25,311 in Lot 21. The average ti fastener cost per unit for the same lots was $1,188 in Lot 17, $1,852 in Lot 18, $2,561 in Lot 19, $2,238 in Lot 20, and $1,637 in Lot 21. (Ex. A-495 at 368)

Bin stock and ti fastener costs are included in Rohr's claim on the basis that major assembly and subassembly hours attributable to actions of DCAS-Santa Ana should contain a normal allocation of these costs and the claim assigns bin stock and ti fastener costs to the Government on that basis. Rohr used the same methodology that it does in pricing its proposals, but based the allocation on a total of 191,688 excess hours attributed to DCAS. When Rohr's consultant was asked whether his analysis included any review of whether bin stock and ti fasteners usage was attributable to any DCAS actions, he testified that the "people who were using the parts" indicated that they were using "more Ti Fasteners and more Bin Stock because . . . the usage was going up and we put things on, rivet them on, and because more things were being scrapped, consequently we had to use more parts." To him

there was an "intuitive sense" in which it was true. (Gillach, tr. 17/42, 48-49; ex. A-495 at 363-64)

The Government, on the other hand, questions whether bin stock and ti fasteners should be correlated to increases in major assembly and subassembly hours in this instance. In Mr. Hubbard's view, there is no logical reason why bin stock, such as rivets, should increase as more labor hours are used to produce an aircraft. In accordance with the drawings, there are, for example, only a specific number of rivets for the specific number of holes that are used in accordance with the drawings. Moreover, he testified, that after the operating guidelines went into effect one would expect to see the costs come down in Lots 22 and 23 if DCAS was a "driver," and he did not believe they did. (Hubbard, tr. 16/112-14)

The assignment of 191,688 excess hours to DCAS is not warranted in view of our other findings. Moreover, we do not see the value of contrasting Lot 17 with Lots 18 through 21 for the same reasons we rejected the idea in connection with the scrap analysis. Lot 18 introduced a model change and most of the costs of the Lot had been incurred before the transfer of responsibility to DCAS. If we were to use Lot 18 as a baseline, the import, if any, of the subsequent changes in lot costs has not been explained. Instead, the assignment of liability to DCAS is based on a summary of general hearsay observations and an "intuitive" feel. The Government, on the other hand, has raised serious questions which undermine the idea of a causal connection here. Though we do not question the intuition, this is an insufficient basis for finding quantum .

Freight

The freight portion of Rohr's claim is $376,813 for additional shipping costs that were incurred to expedite shipments of F-14 components to Grumman. (Ex. A-495 at 365-66) Rohr's normal method of transportation prior to Lots 18 through 21 was to ship F-14 components on trucks from the Rohr facilities in Riverside and Chula Vista, California to the Grumman assembly plant in Calverton, New York. Rohr typically shipped the left-hand and right-hand components for one aircraft together, and used one driver to transport the components to Long Island. Shipments under this method usually required five to seven days. (D. Wilson, tr. 15/21)

According to Rohr's F-14 contract administrator, Mr. David Wilson, in approximately May 1988, Rohr's performance was so far behind schedule that Rohr began expediting the transportation of components to Grumman. Rohr started making split shipments to Grumman, which meant that left-hand and right-hand components were shipped separately. As soon as an inlet and glove had been completed and accepted, Rohr shipped the unit to Grumman without waiting for the matching component for the same aircraft to be completed. Smaller components, such as the daily and weekly doors, often were shipped by air. Rohr also employed teams of drivers so that the trucks could be driven to Long Island without stopping. This reduced the cross-country transportation time from Rohr to Grumman to

approximately three days. (D. Wilson, tr. 15/22; ex. A-523) The claimed amounts include only the increased costs that were in excess of Rohr's normal method of shipping components to Grumman. (Gillach, tr. 17/51-52; ex. A-495 at 365-66)

The Government argues that Rohr has only itself to blame for its delinquent deliveries. Rohr fell far behind schedule in Lot 18 with the model change and never recovered. In its view, Rohr's "numerous recovery plans were [over] optimistic but unattainable, with its addition of inexperienced workers to the production line in Lot 18 and its quality, manpower, and planning problems during the claim period." (Gov't br. at 139-40) Rohr says in reply that while Rohr was behind schedule in Lot 18 before DCAS-Santa Ana arrived, Rohr fell much further behind in May 1988 as a result of the actions of DCAS-Santa Ana.

Our difficulty with this element of Rohr's claim is that it shifts the entire responsibility for the additional freight costs to the Government in an environment where Grumman and Rohr also contributed to the additional costs. No basis has been suggested for allocating a share of the additional freight costs and on the record any effort on our part to do so would be an invitation to speculation. We deny this element of Rohr's claim.

In summary, the materials element of Rohr's claim is denied.

Additional Wheel Well Costs

One of the F-14D model changes involved the redesign of the wheel well assembly. This modification required Rohr to process certain engineering changes and to modify some of the parts and tooling in the initial units. It also caused Rohr to build a new assembly jig for the wheel well assembly. There was testimony from Mr. Steve Carter, F-14 program manager, that he, and several others in management, concluded that there would be "no way" Rohr could "introduce a major engineering change . . . in the Riverside environment under DCAS Santa Ana." He explained that when you're introducing a new component there are going to be "significant engineering changes . . . to get it right." "There will be some changes required to the parts in the initial assemblies that you build. It's an iterative process of developing the assembly, especially using the engineering of the vintage that the F-14 was designed under." This effort is complicated by trying to introduce the change in "a production line that's already moving along . . . ." He decided that the first assemblies should be built in Chula Vista, even though it was a Riverside assembly. He felt that in the Chula Vista environment, Rohr would be able to "go through the development process in a traditional manner and unencumbered and be able to bring the new inlet and glove with its new wheel on line and on schedule."

Rohr assembled four wheel well units for two aircraft at the Chula Vista facility, and made parts for two additional units between February and July, 1989. The 15 Rohr personnel who worked on the units came from the Riverside plant and Rohr contemplated that they

would then become the regular assemblers when the work was returned to the Riverside plant. The Rohr personnel were divided into teams and performed the work on a staggered schedule during this period. Rohr's $44,848 claim for this element represents the lodging and per diem expenses incurred from 2 February 1989 through 24 June 1989 by this group of Riverside employees while they were working in Chula Vista. (Carter, tr. 1/157-61; Gillach, tr. 17/52-54; ex. A-495, -550 at 373)

Mr. Carter testified that when the work was returned to the Riverside plant, the hours per unit increased significantly, even though the same workers with the same tools using the same processes were performing the work. The hours per unit for the Chula Vista units were in the 450 to 500 hour range, while hours per unit for the next four aircraft ranged from 600 to 850. In his view, the only difference between the two Rohr plants was that DCAS-Santa Ana was performing Government inspection oversight at Riverside. (Carter, tr. 1/163-64; ex. A-495 at 228)

The Government argues that Rohr made a business decision to build the first F-14D wheel well units in Chula Vista. The Government agrees that the hours per unit did increase when the crew returned to Riverside. It argues, however, that the reason for the additional hours was a problem with the tooling. When the problem was resolved, the hours per unit for wheel well assembly decreased. (Gov. br. at 140-41) It has pointed to no source in the record for this view and we cannot credit it. We reach the same conclusion with respect to the Government's suggestion that the business reason for the decision to build the first units at Chula Vista was to verify the tools because the tool were being built there. It is based only on the DCAA's auditor's passing reference to coming across a document which so stated, a document that has not been identified. (Hubbard, tr. 16/117)

Rohr argues that if there had been no DCAS disruption in Riverside, Rohr would have built the wheel wells in Riverside. Though Mr. Carter did not expressly state this view during his testimony, it is certainly a fair inference to be drawn from his testimony. However, his testimony left us with the impression that it was a "good call" from a purely business standpoint, regardless of the situation on the line, since a new tool had to be developed and introducing substantial changes in a moving assembly line could be challenging. Moreover, we are asked to assess these costs to the Government based on a decision taken to avoid an expected disruption during a time period when it cannot be said that DCAS was the only source of Rohr's difficulties and with the underlying assumption that if the units were manufactured at Riverside, DCAS would have disrupted manufacturing operations and the costs would have been greater. In addition, without an understanding of why the wheel well hours increased for a time after the transfer to Riverside, a before and after comparison is futile. In the final analysis, Rohr has not persuaded us that DCAS was the principal reason for the decision or that, in any event, the costs claimed are an appropriate alternative way of measuring any damage Rohr would otherwise have suffered. This element of its claim is denied.

Claim Preparation Costs

The total amount of Rohr's claim for claim preparation costs is $2,990,093 out of a total of $3,847,375 in attorney and consultant costs identified to us. The claim preparation costs allocated to Lots 18 through 21 have been verified (stip., ¶ 50) and the Government's DCAA auditor agreed that the methodology employed by Rohr in making its calculations was correct (Hubbard, tr. 16/117-18). The consultants' costs claimed in this appeal total $1,352,617, while counsel's costs total $1,356,447. These costs cover the time period from September 1988 until the certified claim was submitted by Grumman to the Navy on 27 February 1991. Any costs incurred by counsel and the consultants after the certified claim was filed have not been identified to us. Rohr's own claim preparation costs account for $281,029 of the total claimed. The Rohr costs were allegedly incurred between September 1988 and December 1993, with at least $90,287 in costs that were apparently incurred after the CDA claim was filed. None of the cost schedules presented indicates the purpose for which the services were rendered. The source of the schedules was identified as Rohr's legal department. (Exs. G-97, A-550, -494 at 11, 29, 35, ex. A-495 at 375; *see* app. br. at 178)

The amount claimed represents a 50 percent reduction in the expenses incurred by counsel and the consultants from the beginning of the assignment in September 1988 through December 1989 to account for the effort directed toward recovery from Grumman. One hundred percent of the costs incurred from January 1990 up to the filing of the claim in February 1991 have been attributed to the claim preparation effort.

Rohr argues this reduction is a generous concession to the Government because the Grumman portion of the work in 1988 and 1989 was significantly less than 50 percent, and was virtually completed by August or September 1989. (Fuener, tr. 15/222-25) Rohr also asserts that Grumman's actions in submitting a certified claim on 27 February 1991 were intended to assure that Rohr would recover interest from the date of claim submittal until the date of payment. It maintains that after submitting the certified claim, Rohr's conduct consistently evidenced an intent to negotiate a settlement of the claim. It engaged in extensive fact finding and discussions with the Navy for nearly four years in the hope of reaching a settlement, before finally concluding that a settlement would not be possible. In its view the prosecution of the claim did not begin until Grumman and Rohr filed their appeal at the Board. By including claim preparation costs only through 27 February 1991, Rohr argues that it is well within the boundaries of the applicable law and regulations, and is entitled to full recovery.

The Government argues in reliance on *Bill Strong Enterprises v. Shannon*, 49 F.3d 1541 (Fed. Cir. 1995), *overruled in part on other grounds, Reflectone Inc. v. Dalton*, 60 F.3d 1572 (Fed. Cir. 1995) (*en banc*), that Rohr's claim preparation costs are unallowable costs of prosecuting claims against the Government, citing FAR 31.205-47(f)(1). This FAR section provides:

> (f) Costs not covered elsewhere in this subsection are unallowable if incurred in connection with—
>
> (1) Defense against Federal Government claims or appeals or the prosecution of claims against the Federal Government (see 33.201).

FAR 31.205-47(f)(1) was added to the FAR in 1989. Previously, FAR 31.205-33(d) provided, in part, that "Costs of legal, accounting, and consultant services and directly associated costs incurred in connection with . . . prosecution of claims or appeals against the Government (see 33.201) are unallowable. . . ." FAR 31.205-33(d) was deleted from the FAR effective 17 April 1989. At that time, FAR 31.205-33(a) was revised and FAR 31.205-47(f) was added. *See* FAC 84-44, Fed. Reg. 13,022-25 (Mar. 29, 1989).

Under the DFARS 52.243-7001 PRICING OF ADJUSTMENTS (APR 1984) clause incorporated in Grumman's contracts with the Navy, the contract cost principles in FAR Part 31 and DFARS Part 231 in effect on the date of the contract apply. Since the contracts for Lots 18 through 20 were entered into between 31 August 1987 and 14 September 1988 – before the 17 April 1989 effective date, FAR 31.205-33(d) is applicable. FAR 31.205-47(f) is applicable only in the case of Contract -0025 for Lot 21, which was dated 18 October 1989.

The Federal Circuit's analysis in *Bill Strong* was centered on FAR 31.205-33. The Court held that "by specifically referring to FAR 33.201, the amended cost principle of FAR 31.205-33 recognized the word claim as a term of art the meaning of which is set forth in FAR 33.201." The regulation was found to provide "a specific, clear, bright line test for unallowability: a legal, accounting, or consulting cost incurred in connection with the prosecution of a CDA claim or an appeal against the Government is per se unallowable." *Id*. at 1549. However, the subsequent regulatory changes culminating in FAR 31.205-47(f) did not affect the prohibition on allowability of costs incurred in connection with the prosecution of claims or appeals against the Government in any substantive way. Consequently, our discussion of *Bill Strong* applies equally to both FAR 31.205-33(d) and FAR 31.205-47(f).

Bill Strong draws a distinction between legal, accounting and consultant costs incurred in connection with the performance or administration of a contract and in connection with the prosecution of claims or appeals against the Government. The former are allowable, if allocable and reasonable, while the latter are not. As the Court observed, the line is "rather indistinct." The Court was urged by the appellant to adopt a bright-line test of whether a CDA claim existed to determine allowability. If a CDA claim had not yet come into existence, the consultant costs would be "automatically" allowable. The Court rejected the test, focusing instead on the need to demonstrate benefit to the Government. *Id* at 1545.

It found that benefit in the parties' efforts to resolve their disagreements through negotiation and in this context went on to observe that if the costs were incurred before a CDA claim arose, there is a "strong legal presumption that the costs . . . were not incurred in connection with the prosecution of such a claim against the government." 49 F.3d at 1551.

Subsequently, the *Bill Strong* rationale was questioned when the Federal Circuit reversed itself in *Reflectone* and held that equitable adjustment claims could be CDA claims even though they were not in dispute. In so doing it overruled in part *Bill Strong* and other cases that had followed *Dawco Construction, Inc. v. United States*, 930 F.2d 872 (Fed. Cir. 1991). *Reflectone,* 60 F.3d at 1579 n.10.

On the remand of *Bill Strong* to this Board, the Government argued that *Reflectone* called for a change in the result by eliminating the requirement for a dispute before a claim could be a CDA claim. We concluded that even though a CDA claim was filed and the parties were in litigation, evidence must still be taken to determine the purpose for which the costs were incurred. *Bill Strong Enterprises, Inc.*, ASBCA No. 42946, 96-2 BCA ¶ 28,428 at 141,999-142,000; *see also Information Systems & Networks Corp.*, ASBCA No. 42659, 00-1 BCA ¶30,665 at 151,423 (discussing the effect of *Bill Strong* in the context of a termination claim); *contra Plano Builders Corp. v. United States*, 40 Fed. Cl. 635 (1998) (the clear implication of the reference in FAR 31.205-47(f) to FAR 33.201 is that the contractor's submission of a claim pursuant to FAR 33.201 constitutes a part of the prosecution of the claim referred to in FAR 31.205-47(f)). From our perspective then, the mere filing of a CDA claim does not automatically require a conclusion that costs incurred thereafter are unallowable costs of prosecuting a claim against the Government. The answer must depend on an examination of the evidence presented. On the other hand, costs incurred before the filing of a CDA claim are not automatically allowable and any presumption must yield to a consideration of the particular facts and circumstances involved. Whether the costs are incurred before or after the filing of a CDA claim, we must determine the "objective reason" for which the costs were incurred. As the court stated in *Bill Strong*:

> In classifying a particular cost as either a contract administration cost or a cost incidental to the prosecution of a claim, contracting officers, the Board, and courts should examine the objective reason why the contractor incurred the cost. *See Singer*, 568 F. 2d at 721 (judging the 'purpose' of the contractor's submission). If a contractor incurred the cost for the genuine purpose of materially furthering the negotiation process, such cost should normally be a contract administration cost allowable under FAR 31.205-33, even if negotiation eventually fails and a CDA claim is later submitted. *See Armada*, 84-3 BCA ¶ 17,694, at 88,242-43. On the other hand, if a contractor's underlying purpose for incurring a cost is to promote the prosecution of a CDA claim against the

> Government, then such cost is unallowable under FAR 31.205-33.

49 F.3d at 1550.

As the Federal Circuit explained, "[i]n the "practical environment of Government contracts," the contractor and the contracting officer normally enter a negotiation stage after the parties recognize a problem and attempt to solve the problem without litigation. The negotiation process "often involves requests for information by the contracting officer or Government auditors or both, and, inevitably, this exchange of information involves costs for the contractor. These costs are contract administration costs which should be allowable since this negotiation process benefits the Government, regardless of whether a settlement is finally reached or whether litigation eventually occurs because the availability of the process increases the likelihood of settlement without litigation." The Court pointed out that such an approach fosters the Government's basic policy of trying to resolve all contractual issues by mutual agreement at the contracting officer's level, without litigation, and encourages contractors to negotiate rather than litigate.

With respect to Rohr's purpose in incurring the costs in question, the Government argues that the weight of the evidence shows that from the outset Rohr was gearing up for litigation, rather than merely acting to further any negotiation process and essentially "front loaded" much of its litigation costs into the claim preparation effort. It says that the total amount sought, both on its own terms and in relation to the overall claim, is so excessive on its face that it suggests strongly some purpose other than furthering a negotiation process. In this respect, the Government does not object to Rohr's internal costs incurred after the claim was filed; however, it maintains that Rohr has failed to provide sufficient details to permit the Board to determine whether all of the costs sought were in fact incurred for the purpose of furthering discussions between Grumman, Rohr and the Government. (Gov't. br. at 142-43)

The Government further asserts that while Rohr may not have sorted out the details at the time it brought in counsel in late 1988, it believed that DCAS was responsible for some of its cost overrun. And, by the time Rohr filed its proposal support document (PSD) in March 1989, it had determined "officially" that DCAS actions had caused some of the cost overrun. At the very least, from this point forward, Rohr's lawyers and consultants were preparing for trial. It argues that the decision to bring in a team of litigators to direct this effort is "powerful evidence" that this was not merely a fact finding exercise in furtherance of negotiation, and the "massive effort" involved here appears to bear little relationship to contract administration. Moreover, the extent to which the "claim preparation" work product was lifted wholesale and used by Rohr during the hearing indicates that Rohr's original purpose in incurring the costs was to prosecute a CDA claim.

Bill Strong addressed legal and consultant costs incurred by a prime contractor, not a subcontractor. However, we do not see this as a barrier to recovery by a subcontractor under

a sponsored appeal, if it otherwise meets the criteria established by the *Bill Strong* decision. Nevertheless, the nature of the prime contractor/subcontractor relationship must first be taken into account, specifically the arrangements the parties have made with respect to appeal rights. Once the subcontract relationship is accounted for, we believe the question should be the same: whether the evidence shows that the "objective reason" the subcontractor incurred the cost was for "the genuine purpose of materially furthering the negotiation process."

In September 1988, Rohr's general counsel engaged present counsel for three basic purposes: first, to analyze what was happening on the F-14 program, although Rohr knew there were problems with DCAS and Grumman; second, to assess responsibility for the cost growth among Rohr, Grumman, and DCAS; and, third, to help the company prepare proposals to recover any costs that might be recoverable under its subcontract with Grumman. (Fuener, tr. 15/97-103, 107-10; Lewis, tr. 16/158-59)

We have accepted the testimony characterizing Rohr's tasking; however, the description does not permit us to understand the details of the assignment — details that we believe are crucial for understanding the purposes for which counsel and, in turn, the consultants were engaged. We think the Government has advanced arguments as to the bases for the costs incurred that cannot be disposed of by reliance on general testimony. The agreements engaging counsel and the consultants have not been made part of the record and no testimony was offered by Rohr representatives concerning the purposes for which counsel and the consultants were hired and the scope of their assignment. Moreover, we are not in a position to determine whether the costs incurred prior to claim submission were incurred for the genuine purpose of furthering the negotiation process with the Government, either prior to or after claim submission.

The record that is before us discloses a litigation posture from the outset. The initial focus was on Grumman, for its own actions and those of the Government as Grumman's "agent," in the event Grumman would not sponsor an appeal. The 14 July 1988 letter to Grumman from Rohr's vice president, commercial business, made clear that if Grumman did not protect Rohr's "right to appeal to the appropriate board or court," Rohr would be required to bring an action against Grumman. Subsequently, by letter dated 22 August 1988, Rohr promised Grumman that it would "provide full support for its claim" and would "certify that claim as required by the Contract Disputes Act."

The efforts of counsel and the consultants facilitated the settlement Rohr reached with Grumman in September of 1989. One feature of the 19 October 1989 settlement agreement was Grumman's agreement to sponsor Rohr's appeal. Specifically, the agreement reserved "Claims and REAs by Rohr in the nature of constructive change or other claims alleging that acts or omissions of the Government have impacted Rohr production effort." Grumman agreed to sponsor Rohr's efforts "to process such claims and REAs to the Government." Grumman was to complete its evaluation within six months of its receipt of Rohr's CDA certification of "that claim or REA" and, if appropriate, submit it to the

Government. Counsel and the consultants also prepared the subsequent certified claim that Grumman submitted on Rohr's behalf to the Navy, along with its own claim.

Rohr has reduced the costs claimed by 50 percent from the beginning of the assignment in September 1988 through December 1989 to account for the effort directed toward Grumman. We do not understand the basis for this general allocation. One could as easily suggest that the Government should bear no more than one-third of the costs on the ground that this is the share of Rohr's expected overrun that was assigned to it in Rohr's September 1989 analysis. Moreover, an explanation of why the Government should be assessed the costs of gaining Grumman's agreement to sponsor its appeal and to certify its claim would appear to be in order.

In any event, apart from our questions about the proper allocation of Rohr's claim preparation costs, we cannot say that Rohr ever backed away from its initial litigation stance. We note in this regard that when the overall claim was submitted to the contracting officer on 27 February 1991, it was intended to be a step in the prosecution of a CDA claim against the Government. In its 21 April 1992 letter to the contracting officer, Grumman is explicit that the 26 February 1991 claim letter was intended "to constitute a claim within the meaning of the CDA." In this context, even if we were to assume that Rohr was entitled to recover its claim preparation costs, Rohr's post-claim submission costs would not be recoverable.

Under the circumstances, Rohr has not proved that the costs claimed were incurred for the genuine purpose of materially furthering the negotiation process. The claims preparation element of Rohr's claim is denied.

G&A, CAS 414 Cost of Money, and Profit

Rohr's claim includes an average G&A rate of 6.1 percent and an average CAS 414 cost of money rate of 2.2 percent, the elements of which are not disputed. We accept the average rates and apply them to costs in the manner stipulated by the parties. (Stip., 74-82; ex. A-494 at 3-11, columns 11, 13; Hubbard, tr. 16/118). Rohr also seeks a 15 percent profit rate, which we find reasonable, as discussed below, based on the evidence presented.

Rohr normally proposes 12 to 18 percent profit for its work on military programs. (Johnson, tr. 1/93-94; Leslie, tr. 5/145-46; 149, D. Wilson, tr. 14/252) It sought a profit of 15 percent for Lots 20 and 21 and realized a profit of approximately 15 percent on Lots 22 and 23. (R4, tab 381; D. Wilson, tr. 14/252-53) Rohr seeks a 15 percent profit here as part of any equitable adjustment to which it may be entitled, although it believes a greater percentage would be warranted. It has supported its position with a weighted guidelines analysis prepared in accordance with the Department of Defense Federal Acquisition Regulation Supplement (DFARS) 215.970 *et seq*. (1995). (See DFARS 215.404-4 through 215.404-72 (2000) for current coverage.) (DiGiacinto, tr. 18/94-126; ex. A-557) The principal weighted guidelines analysis focused on Rohr's circumstances during the

performance of Lots 18 through 21 and indicated an 18.43 percent profit would be warranted, while an alternate, more conservative analysis (using only the midpoint ratings for all of the factors and characteristics), suggested a 17.26 percent profit. Apart from the acceptance of a 15 percent rate in connection with Lots 22 and 23, we found the principal and alternate weighted guidelines analyses persuasive and supportive of the profit rate claimed.

The use of a weighted guidelines analysis in assessing profit in connection with an equitable adjustment is well established. *See, e.g., Systems and Electronics, Inc.*, ASBCA No. 48178, 98-1 BCA ¶ 29,710 (weighted guidelines profit rate used in negotiating a contract modification was found reasonable for the increased cost caused by a Government delay); *Southwest Marine, Inc.*, ASBCA No. 33208, 88-3 BCA ¶ 20,982 (10 percent profit awarded based in part on consideration of weighted guidelines analysis indicating that 15 percent would be warranted); *Norair Engineering Corp.*, ASBCA No. 10856, 67-2 BCA ¶ 6619 (weighted guidelines approved by Board as a reasonable method for determining a reasonable profit in construction cases). Moreover, we believe it is appropriate to consider the situation Rohr was faced with when the actions for which it seeks recovery occurred and the Government has not questioned the validity of the principal analysis or, for that matter, any of the analyses.

The Government has focused, instead, on the declining profitability of Rohr's contracts, while acknowledging that a weighted guidelines analysis is one possible method of arriving at profit. It argues that an examination of what profit Rohr actually attained in previous F-14 lots is the best evidence of the profit to which Rohr may be entitled. (Gov't br. at 141-42) The Government points out that Rohr's actual profit for the F-14 nacelle and inlet and glove declined consistently during Lots 14 through 17. Rohr's actual profit for the F-14 nacelle and inlet and glove at the completion of each lot was: Lot 14 – 21.0 percent; Lot 15 – 19.5 percent ; Lot 16 – 9.9 percent ; Lot 17 – 4.7 percent. (R4, tab 37 at 17) The Government argues that when Rohr signed the 1985 MOU with Grumman, agreeing to the $2.3 million per shipset price, Rohr expected to make a very small profit on lots 18 and 19 and to break even or lose money on lots 20 and 21. (Hubbard, tr. 20/69-70) It says that given Rohr's increasing costs from lot to lot, Rohr's costs would have exceeded its five year fixed price with Grumman of $2.3 million per shipset for Lots 18 through 21 during Lot 19. Moreover, Rohr was in a serious loss position before the change in cognizance to DCAS-Santa Ana in Lot 18. The Government concludes that Rohr is not entitled to any profit on any equitable adjustment since it would not have made any profit on the lots in question.

Even if Rohr's profit expectations may have been diminished or even if it was in a loss position because of other performance problems, it is entitled to a reasonable profit as a part of the equitable adjustment compensating it for its increased costs of performance caused by the Government's changes to the established inspection practices. *See Stewart & Stevenson Services, Inc.*, 97-2 BCA ¶ 29,252 at 145,522-23, *aff'd on reconsid.*, 98-1 BCA ¶ 29,653 (contractor entitled to reasonable profit on increased performance costs caused by

Government changes even though original work was bid at a loss). We conclude that a 15 percent profit is reasonable under the circumstances.

Summary of Quantum Award

Based on our determinations, the appeal is sustained in the following amounts:

Major Assembly	$1,754,101
Direct Services Labor	
Quality Assurance	$941,739
Corrective Action Board	$1,163,188
Manufacturing Engineering	$361,821
Production Engineering	$552,299
Industrial Engineering (Riverside)	$76,460
Processing	$105,884
Total Direct Services Labor	$3,201,391
Allocated Services Labor	$378,073
Special Teams	
Planning Audit	283,389
Planning Rewrite	722,212
Total Special Teams	$1,005,601
Total Labor & Overhead	$6,339,166
G&A (Average 6.1%)	$386,689
Total Cost	$6,725,855
Profit (15%)	$1,000,878
CAS 414 COM (Average 2.2%)	$147,969
Award Amount	$7,874,702

Interest on this amount is awarded in accordance with the CDA from the date the claim was received by the contracting officer.

The appeal is sustained to the extent indicated.

Dated: 12 February 2001

MARTIN J. HARTY
Administrative Judge
Armed Services Board
of Contract Appeals

I concur

I concur

MARK N. STEMPLER
Administrative Judge
Acting Chairman
Armed Services Board
of Contract Appeals

EUNICE W. THOMAS
Administrative Judge
Vice Chairman
Armed Services Board
of Contract Appeals

NOTES

[1] For ease of reference, we have referred to Rohr in this opinion as if it were the appellant before us. We do not mean to imply that Rohr had privity of contract in this matter with the Government.

[2] The Government has made a number of concessions as our findings acknowledge. It has argued, however, that Rohr's reliance on "admissions" by the contracting officer who issued the final decision is not only irrelevant but pointless since once a suit is brought following the contracting officer's decision, the findings of fact in that decision are not binding on the parties and are not entitled to any deference, *citing Wilner v. United States*, 24 F.3d 1397 (Fed. Cir. 1994) (*en banc*). The Government has also argued that it "logically follows" that the conclusions a contracting officer reaches while analyzing the claim prior to writing a final decision are similarly entitled to no weight. We do not agree. *Wilner* prescribes how we treat fact findings and conclusions reached by the contracting officer in a final decision. *Wilner* does not provide a basis for excluding evidence from the contracting officer who issued the final decision or evidence from predecessor contracting officers or, for that matter, those who reviewed the claim on behalf of the contracting officer. We recognize in this regard that a contracting officer's testimony may be based on an independent examination of the events after the fact. This is not an uncommon role for a contracting officer and the evidence is entitled to be heard since it stems from the contracting officer's responsibility to independently evaluate the merits of the contractor's claim. We may, of course, give appropriate weight to the contracting officer's evidence. *See ITT Defense Communications Division*, ASBCA No.

44791, 98-1 BCA ¶ 29,590 at 146,700 (*Wilner* does not provide a basis for excluding evidence from the contracting officer who issued the final decision, nor evidence from those who reviewed the claim on behalf of the contracting officer); *Wilner*, 24 F.3d at 1403 (in any given case contracting officer testimony "certainly is admissible" subject to the Federal Rules of Evidence).

[3] The major assembly labor hours incurred (stip., ¶ 43; Hubbard, tr. 16/77-80) on Lots 18 through 21, the labor rates used (stip., ¶ 59; ex. A-494 at 1, column 6), and the overhead rates (stip., ¶ 67; ex. A-494 at 1, column 8) have been verified by the Government from Rohr's accounting records. The common shops labor hours (fabrication, subassembly, and adhesive bond) (stip., ¶ 44; ex. A-495), labor rates (stip., ¶ 60; ex. A-494 at 1-2) and overhead rates (stip., ¶ 68; ex. A-494 at 1-2, column 8) have also been verified. The direct services labor element's labor rates (stip., ¶ 61; ex. A-494 at 3-4, column 6), incurred hours (stip., ¶ 57; ex. A-494 at 3-4, column 5), and overhead rates (stip., ¶ 69; ex. A-494 at 5-6, column 8) are also established. All of the calculations and the source documents, including the headcount data, comprising the direct services labor portion of Rohr's claim have been reviewed and are accepted by the Government. (Stips. ¶¶ 45, 51, 53, 57; ex. A-494 at 3-4; Hubbard, tr. 16/106) The Government also concedes that Rohr's method for calculating allocated services labor is correct. (Gov't br. at 130; Hubbard, tr. 16/106-108). The base production hours (stip., ¶ 46; ex. A-494 at 5-7, column 1), labor rates (stip., ¶ 62; ex. A-494 at 5-7, column 6), and overhead rates (stip., ¶ 70; ex. A-494 at 7-9, column 8) used in calculating allocated services labor incurred at the Riverside and Chula Vista plants on Lots 18 through 21 have all been verified.

All of the special teams costs were charged to Lot 20, because most of the efforts of these teams were incurred during the performance of Lot 20. (Fuener, tr. 15/116, 117; Gillach, tr. 17/37-40; ex. A-494 at 8; ex. A-495 at 358-62) The special teams hours charged to Lot 20 have been verified by the Government from Rohr's accounting records (stip., ¶ 47; ex. A-494 at 8, column 1), including the labor rates (stip., ¶ 63; ex. A-494 at 8, column 6) and the overhead rates used (stip., ¶ 71; ex. A-494 at 8, column 8). The hours incurred (stip., ¶ 58; ex. A-494 at 8, column 5) and the labor dollars (stip., ¶ 66; ex. A-494 at 8, column 7) for the special teams portion of the claim have been verified and accurately calculated. (Hubbard, tr. 16/110)

The materials costs incurred for freight, scrap, ti fasteners and bin stock on Lots 18-21 have been verified by the Government from Rohr's accounting records. The freight costs incurred for expedited shipments in Lots 18-21 have been verified by the Government from Rohr's accounting records. The Government has confirmed that the calculations for the scrap portion of the claim are accurate, and that all source data have been verified from Rohr's accounting records. It is agreed that the material rates and the total major assembly and subassembly hours incurred for Lots 18-21, used as a baseline for calculating a rate per hour for ti fasteners and bin stock, as well as the claimed major

assembly and subassembly hours used in the ti fasteners and bin stock portion of the claim, are accurately stated. (Stip., ¶¶ 48, 52, 54, 55, 56; ex. A-494 at 9, columns 2, 3, 4; Hubbard, tr. 16/112-17)

The additional wheel well costs are based on actual travel and per diem expenses claimed. The Government's auditor has confirmed that the calculation of these costs is accurate and that the source data has been verified from Rohr's accounting records. The travel and per diem expenditures for additional wheel well costs on Lot 20 have been verified by the Government from Rohr's accounting records. (Stip., ¶ 49; ex. A-494 at 9, column 1, exs. A-495, 550 at 373; Carter, tr. 1/160-61; Gillach, tr. 17/53-54; Hubbard, tr. 16/116-17)

[4] The study involved the review of 1,385 SMRRs, and 3,922 discrepancies that appeared on the withhold tags. For each discrepancy on the SMRRs, the following information was recorded: (1) the SMRR number; (2) the part register number; (3) the Rohr withhold tag number; (4) the date the withhold tag originated; (5) the part number; (6) the location in the manufacturing process where the withhold tag originated; (7) the identity of the Rohr MRB engineer who dispositioned the withhold tag; (8) the Rohr MRB disposition date; (9) the type of discrepancy encountered; (10) the type of disposition determined by Rohr's MRB engineer; (11) whether the discrepancy previously would have been a standard repair, and if so, which standard repair would have applied; (12) the identity of the DCAS representative who reviewed the withhold tag; (13) the date of the DCAS disposition on the withhold tag; (14) the type of disposition determined by the DCAS representative; (15) whether Grumman concurred with or rejected Rohr's proposed disposition; (16) the date of the NAVPRO disposition; (17) the number of "delay days" associated with the discrepancy; (18) whether Grumman engineering considered the discrepancy to be a major or minor nonconformance; and (19) a "comment" section if there was anything unusual or noteworthy about the discrepancy or the review of the withhold tag.

The "delay days" computed in the study represent the number of calendar days attributable to DCAS-Santa Ana requiring the elevation of a minor nonconformance or standard repair on a SMRR form for Grumman and NAVPRO review. The delay period does not include any time normally required for Rohr to process a discrepancy of the type recorded. In the case of a minor nonconformance, the delay period is measured from the date of the Rohr MRB engineer's disposition until the date of NAVPRO's disposition. In the case of a standard repair, the delay period is measured from the date of withhold tag origination until the date of NAVPRO's disposition. The "delay days" in each case represent the number of days added to the withhold tag processing time as a result of DCAS-Santa Ana's improper or unnecessary elevation of withhold tags for Grumman and NAVPRO review. For the few withhold tags that Rohr itself elevated to SMRRs, zero delay days were entered on the summary sheet because DCAS-Santa Ana

was not responsible for any delay associated with processing the withhold tag. (Hammond, tr. 13/133-61, 162-68; exs. A-442, -443, -444)

[5] We arrived at the following percentages of production hours attributable to DCAS for the various function codes: FC-24 processing (RV) .12 percent, (CV) 1.46 percent; FC-28 production control (RV) .86 percent, (CV) .86 percent; FC-29 manufacturing support (RV) .24 percent, (CV) 2.86 percent; FC-73 manufacturing engineering (RV) .51 percent, (CV) 1.26 percent; FC-91 production engineering (RV) .03 percent, (CV) .08 percent; FC-93 industrial engineering (RV) .5 percent, (CV) .69 percent; FC-94 corrective action board (RV) .79 percent, (CV) .71 percent; FC-95 quality assurance (RV) 4.10 percent, (CV) 5.44 percent.

I certify that the foregoing is a true copy of the Opinion and Decision of the Armed Services Board of Contract Appeals in ASBCA No. 50090, Appeal of Grumman Aerospace Corporation (on behalf of Rohr Corporation), rendered in conformance with the Board's Charter.

Dated:

EDWARD S. ADAMKEWICZ
Recorder, Armed Services
Board of Contract Appeals