

Quality Control No. 2



TESTING DISTORTION. This Avro CF-100 windscreen is being tested for optical distortion by E. G. Revette, an Avro inspector. With him is G. D. Jones, RCAF inspector of aircraft. The distortion is being measured by the photo-grid system.

The Case for Government Inspection

By W/C G. B. Waterman

The topic I have chosen for this article is one which, among that select group of persons deeply involved in the production of equipment for Canada's defense forces, ranks just behind religion, politics and the gentle sex as a subject for controversy. I hope this paper proves an exception to the rule.

My brief research into the history of government supervision or inspection of defense production failed to reveal the origin of this ubiquitous practice. It was almost certainly utilized by the Pharaohs of ancient Egypt, but my information links the beginning of military inspection to Julius Caesar.

It is reported that the General, on examining a shipment of Greek gladii, found that a large number did not meet specifications. He waxed exceedingly wroth, and swore to Jove, "Illud rem decernit. Hinc iam nos ipsi damna inspicimus!" Loosely translated this means "That settles it. From now on we'll inspect the cursed things ourselves!"

Whatever its history, there can be little doubt that military inspection is here to stay. All contractors will admit this to be true. But their attitude toward government control is not nearly so unified.

To some, it is heinous interference,

designed solely to cause difficulties and lessen chances of making a "reasonable" profit. To many others, government intervention is a necessary evil.

To the majority of the defense industry, it is a reasonable, or even a good thing. Dean Stowell, Canadair's Vice-President Manufacturing said recently that government inspection was "potentially an arrangement which should lead to a better product, because the viewpoint of the user is represented during the process of design and manufacture."

The Service View

RCAF opinion of military inspection is not as varied as that of industry. It has proved itself a necessary and valuable tool in the logistics program. Air Force experience shows that government supervision of contractors serves two purposes:

- (1) It guarantees that military equipment meets specifications.
- (2) It increases the buying power of our defense dollar, by decreasing the cost of purchasing quality.

Quality is, after all, not always the aircraft contractor's first consideration. Nor can he argue successfully that it is. His company organization chart will almost always prove him wrong.

He is guided primarily by the need

to be able to show a real profit to shareholders. To this end, volume of sales is usually a more important criterion. The RCAF cannot accept any standard other than performance, and must get weapons of high quality in design as well as in manufacture.

Here, then, is the reason for RCAF inspection, the reason why it can be a continuous source of friction between the service and its suppliers.

Military inspection is not the same thing now as it was during the hectic days of World War II. Methods have changed considerably since the day almost 20 years ago when the first RCAF inspector walked through the front door of a Canadian aircraft plant.

Then the government requirements for fighting material increased from the wafer-thin provisioning of 1938-39 to the staggering quantities needed to wage a global war, almost overnight. In just over a year production skyrocketed by more than 500 percent.

Industry faced this exploding requirement with several strikes against it, however. Not only was time at a premium, but there were also staggering shortages of trained men, material and machines.

The result was inevitable. Company quality practices could not hope to handle the situation. The Government

was forced to move in with thousands of its own inspectors—19,000 at the peak of production—to measure the quality of work coming off the production lines.

Was this a painless solution?

Need I ask?

Government inspectors in 1939 were undertrained, underpaid and inadequately supported except by government "red tape." They did what they could with the antiquated, inadequate procedures to carry out the 100% inspection which was the order of the day. A further hindrance was lack of suitable design specifications and requirements. Yet, in spite of these drawbacks, the needed war material kept flowing off the production lines into the hands of the military forces.

Twenty years later, the situation is a good deal brighter. The Korean production panic of 1950 finally proved to everyone, military and civilian alike, that the old methods were no longer usable, and that a new type of military supervision was required, a system on which rapid, efficient expansion could be based in time of war.

The post-Korean period of continued high production with some emphasis on economy provided the atmosphere in which the new procedures could be developed. With quality needs higher than ever, industry, backed by a large, trained labor pool, modern machines, and production methods, was ready to learn, with and from the RCAF, new quality control concepts.

The result in late 1957 is a new type of customer-producer relationship which is expected to pay big dividends.

No one will deny the customer his right to purchase goods at the lowest possible cost. Industry, in production of either defense or consumer goods, lives with the age-old dictum of customer control, even when this dictatorship includes the "how" of manufacture as well as the "what."

The customer (in our case, the RCAF) cannot afford to "accept" his purchase after shipment, because testing and rejection at this stage is too expensive. He therefore applies control at the source of manufacture. From this he gains such advantages as:

- (1) Early determination of product quality.
- (2) Preclusion of packaging and shipping of below specification material.
- (3) Hastening replacement of non-standard material.
- (4) Speeding of producer's corrective action.
- (5) Reduction in cost and avoidance of untimely delays.

For harmonious relations between the RCAF and its contractors the causes of conflict must be reduced to a minimum. As P. S. Conroy, head of DND Inspection Services, has put it, "The principles which must be adopted to maintain good relationships between government inspectors and industry seem to be a full and complete understanding of each other's role in the production of the particular type of equipment."

This requires that the Government recognize the rights of the contractor, and vice versa.

The contractor has the right to design, develop and manufacture his product, and should not be hindered in so doing. At the same time, he has the responsibility to know his contract thoroughly, to live up to its clauses and specifications, and to understand that no amount of government inspection can relieve him of any of that responsibility.

The Government's rights and responsibilities can be similarly defined.

How Much is Right?

I would say that the minimum necessary to achieve its purpose is the right amount of government inspection.

In a report prepared for the National Industrial Conference Board, Inc. in 1951, the U. S. industry decried with a single voice the wartime principle of 100% inspection. That is duplication or replacement of contractor's inspection by government acceptance or rejection.

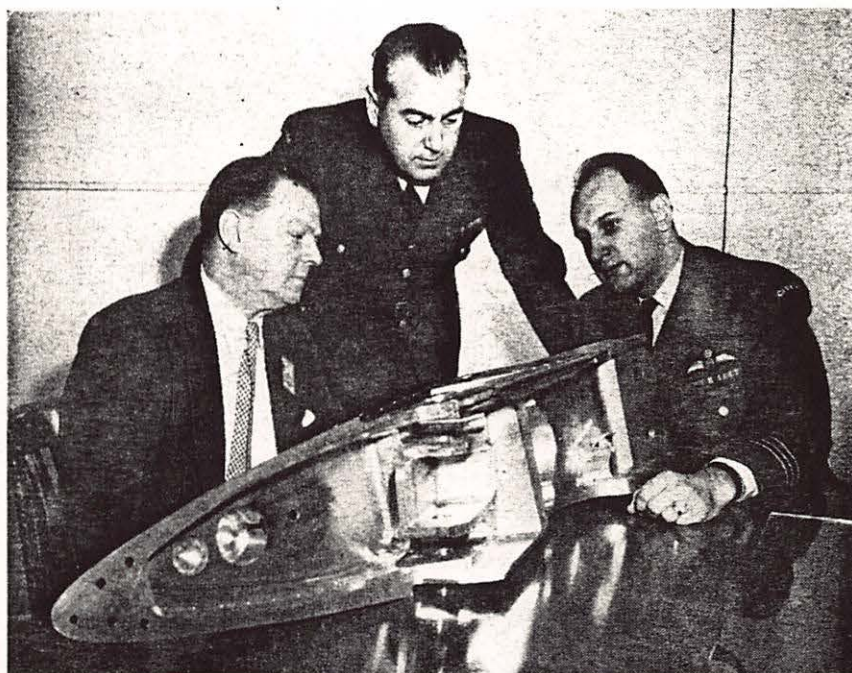
The American armed forces could not agree more, describing the war-born system as highly inefficient, impractical and uneconomical. In the same report, industry generally echoed the opinion of a rubber company executive who said, "the best approach is through the employment of a relatively small force of carefully selected, well-trained, experienced inspectors, whose function would be to satisfy themselves of the general level of quality control in the industries which they cover." He went on to point out that, in emergencies, this force would not require great expansion, but could train additional personnel to the extent required.

The beneficial effects of reduced government inspection applied in accordance with modern, flexible policies were quickly realized by American and Canadian military services, including, of course, the RCAF. The advantage of "surveillance" inspection, as it is called, are many, and include:

- (1) Increased acceptance of responsibility by the contractor.
- (2) More efficient inspection with less friction.
- (3) Reduced government inspection costs.

To illustrate the third point, the RCAF actually employs about 400 inspectors to oversee the work of roughly 6,000 company quality control personnel in Canadian plants which did \$325,000,000 worth of work for the RCAF last year.

(Continued on page 90)



FOR THE CF-105. Discussing the main pick-up fitting for the CF-105 undercarriage, (left to right): J. Fairbairn, quality control and inspection manager, Avro Aircraft Ltd.; F/O R. G. Sheard, technical services representative RCAF, at Avro; and the author of this series, W/C G. B. Waterman, officer commanding technical services detachments with Avro. This piece of equipment is machined from solid block.

Quality Control No 2

(Continued from page 57)

The hardest thing to determine is the optimum amount of government control to be applied at different contractors' plants. This is affected by many variables, such as product complexity, plant capability, management policy, etc. The target should be that control which gives the best product quality/inspection cost relationship.

Obviously too little government inspection can mean lower quality through lack of customer control, while too much inspection could easily make the costs of quality too much to bear. Experience proves that the right amount of military surveillance will improve production efficiency and lower product costs.

RCAF Quality Control policy is aimed at determining that optimum relationship. To this end a brand new surveillance order has been adopted wherein flexibility of operation and the use of data analysis in planning receive the main emphasis. The manufacturer is allowed to decide the "how" of quality control, after his contract has defined the "what."

Standardization is adopted, where

practicable, in methods and procedures with other government inspection bodies, inside and outside Canada. This standardization also covers such things as quality control clauses in specifications and contracts. RCAF inspectors are trained to a level more than equivalent to that of industry quality control personnel. Active co-operation with AITA and the American Society of Quality Control is maintained to sell quality to company management.

Experience has shown all of us, as customers, that we can always obtain better quality in any purchase by close supervision of the supplier. The RCAF experience has been no exception, and I think that the industry would agree with the RCAF that it would be unbusinesslike for this government control to stop.

If I may paraphrase both Dean Stowell and Mr. Conroy: Government inspection can pay big dividends in procurement, providing that both the Department of National Defense and the aircraft industry are aware of each other's responsibilities and problems. Provided with a common aim, customer and supplier can work together with mutual respect to produce the high quality material required by the RCAF for the defense of Canada.