

## QUALITY STANDARD ISO 9000

### What does it mean? . . . . .

In July 1994 most of the Divisions within GEC-Marconi Avionics not certified to an international standard will be assessed to ISO 9001. Our Customers demand that we demonstrate we operate an effective quality system. In the words of one senior MoD representative:

**'No Acceptable Certification - No Contract'**

Certification to ISO 9001 fulfils this requirement. Success is vital.

The ISO 9000 series of documents (of which ISO 9001 is the most comprehensive covering design/development, production, installation and servicing) is the international version of BS5750. This has been evolving for a number of years as an acceptable standard for use by

industries both in the manufacturing and service sectors. It has now achieved full international acceptance, and has caused the Ministry of Defence to cease its own assessments to the AQAP series of standards. All Companies wishing to supply the MoD are now obliged to be certified to the ISO standard.

So how is ISO 9000 different from the AQAP? The most significant difference lies in the fact that AQAP was an assessment carried out by a customer of the capability of one of its major and, probably, highly valued suppliers, ie. it was a second-party assessment. ISO 9000 assessments, on the other hand, are carried out by an independent third party organisation which has no business interest in the outcome, other than the

purely professional one of performing the assessment correctly and impartially. This means that an assessment to the ISO is likely to be more broadly based than those carried out under the AQAP standard which tended to concentrate on the specific interests of the customer.

ISO 9000 sets out the requirements for establishing, documenting and maintaining a quality system. Its aim is to ensure that operations impacting on a product or service are performed in a consistent and controlled manner. However, ISO 9000 is not confined to those processes associated with the final manufacture.

Total Quality Management (TQM) has introduced the 'internal customer' concept and the total interdependence of all sections

and departments in a business. The ISO reflects this and addresses twenty key functions in the assessment. These functions affect everyone within the Company and therefore necessitate each and every one of us having a clear understanding of what we do, how we do it, how it is controlled and how it is recorded, to whom we report and who reports to us.

Over the next few weeks 'awareness sessions' will take place as we move towards the assessment in July.

ISO 9000 is the internationally accepted way in which business will operate for the foreseeable future. It has much to offer in terms of reducing the 'hassle' of the workday lives of us all. It is a requirement of GMAv's customers that the Company has ISO 9001 certification.

## A MESSAGE FROM GMAv's MANAGING DIRECTOR

I was delighted to be present at the recent award ceremony in Basildon when GEC's Chairman, Lord Prior, received the ISO 9001 (BS5750) certificate on behalf of Sensors Division. This rewarded many months of intense activity as the first of the GMAv Divisions was assessed against this quality system by an independent agency. Their pride in their achievement, mixed with some relief, was evident and I am, and was, very pleased to be able to add my personal congratulations.

However, there is still much to be accomplished by the remaining Divisions following this excellent lead. This challenge - and it is a very significant challenge for a company of our size to obtain immediate certification - is already being faced. In July this year Support, Displays, Flight Systems, Navigation, and Radar Divisions will be assessed. Power Systems Division will follow in 1995.

It is vital that we all recognise that success in this enterprise is essential to enhance our position as a major player in our world-wide markets. The cost of failure is high. The wholehearted commitment of



everyone is the key to our success. This, above all else, means that functional Heads of Departments and their staff must accept ownership of, and responsibility for, their various working procedures and instructions. In the coming months Divisions must dedicate resources to this activity to ensure success. This is a priority commitment for all of us.

We already have good cause to be proud of our quality record and this is an opportunity to demonstrate our continuing commitment to quality and to assure our customers of our constant high standards.

*Derek Dickinson*

Derek Dickinson  
February 1994

## WHO WILL ASSESS US?

As a major player in the design and manufacture of defence systems and equipment, who else should GEC-Marconi Avionics turn to for certification to ISO 9001, but the No.1 certification company for the defence market - Lloyd's Register Quality Assurance (LRQA)?

With a background pedigree in shipping from its parent company - Lloyd's Register of Shipping - LRQA combines the best of the traditional with all the benefits of a new, progressive company, dedicated to continuous improvement. As a leading

international certification company, LRQA offers the reassurance of a quality service, accredited by the National Accreditation Council for Certification Bodies (NACCB) and backed by successful partnerships forged with hundreds of companies that are household names.

LRQA assessors are qualified to assess all major defence suppliers competently moving from warships to aircraft. Their customers include: Vickers Ship building; BAe Dynamics; Short Bros., Vosper Thornycroft; to name but a few.



*Pictured are (back row, l-r) Kevin Smith LRQA Business Manager and Brian Liddle GMAv (front row l-r) Roger Wood, LRQA Team leader and Stuart Barclay of GMAv, during the negotiations for the award of the contract for the ISO 9001 assessments. Kevin takes part in the preliminary assessment and Roger will lead the team throughout.*

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# OUR QUALITY POLICY

## The Specifics of ISO 9001

The nature of the business in which we operate means that certification must be gained for both our hardware and software. Because of this the main documents in the ISO 9000 series that we will use are:

- (a) ISO 9001: which covers Design/Development, Production, Installation and Servicing.
- (b) ISO 9000-3: which gives guidelines for applying ISO 9001 to the Development, Supply and Maintenance of Software.

Our assessment in July will be carried out to the 1987 version of ISO 9000. Subsequent reviews, which take place every 6 months will progressively incorporate the requirements of the revised issue which is due now.

The Standard aims to improve the way in which work is done and starts with the definition of a Company quality policy issued by the Managing Director. The GMAv Quality Policy statement comprises three elements:

- **Total commitment to meeting the requirements of customers, both internal and external.**
- **Continuous improvement through participation of all employees and development of supplier relationships.**
- **To have an effective and economical quality system and ensure that all staff understand and implement the system.**

We must all be familiar with our Quality Policy and understand how it effects us in our day to day activities. Our implementation of the Policy will provide the long term success for the business.

The clauses in ISO 9001 define:

- Management Responsibility.
- Quality System.
- Contract Review.
- Design Control.
- Document Control.
- Purchasing.
- Purchaser Supplied Product.
- Product Identification and Traceability.
- Process Control.
- Inspection and Testing.
- Inspection, Measuring and Test Equipment.
- Inspection and Test Status.
- Control of Nonconforming Product/Service.
- Corrective Action.
- Handling, Storage, Packaging and Delivery.
- Quality Records.
- Internal Quality Audits.
- Training.
- Servicing.
- Statistical Techniques.

This list demonstrates the extent of the Assessment and indicates that everyone in the Organisation is directly affected and closely involved.

# GEC-MARCONI AVIONICS' ASSESSMENT TO ISO 9001

## A Message From Roger Wood, LRQA Team Leader

I am sure that uppermost in your minds as you lead up to the LRQA assessment is the fear that, on the day, an army of 'jack-booted stormtroopers' will descend on your premises, pin some unfortunate individuals to the wall. They will tear apart the



quality system on which you have laboured and then revel in writing up reams of Non-Compliance Notes (NCNs) to justify their continued existence! Let me assure you that nothing could be further from the truth.

As team leader from LRQA, I will be heading a team of QA professionals, all of whom in previous employment have been involved in quality management within defence related industries and are experienced quality system lead assessors. The team has been provisionally planned to include myself (Roger Wood), with Dave Kneller, Paul Bath, Tony Shaw and Joe Bleasdale. All were involved in the successful assessment of Basilidon's Sensors Division.

Our brief is, very simply: **'To gain an assurance that GEC-Marconi Avionics has a documented quality system that complies with the requirements of ISO 9001 and that records confirm that the system is implemented.'**

The assessment is conducted in two stages. **Stage 1** reviews the system as documented in your Quality Manual and Procedures. This confirms that all clauses of the standard are adequately covered. This is a desktop exercise on your premises and allows for outline planning of the actual assessment programme.

During **Stage 2** the implementation of your documented system is assessed to confirm that you are actually applying the procedures. LRQA team members will visit selected areas and interview managers and staff at work. The minimum of time will be spent in managers' offices and the maximum in the workplace, talking to sales staff, designers, production operators, stores people, inspectors, testers. This is because we are interested in the people operating the system. We will be sympathetic to those who are nervous and will ask you to guide us through your system and show how you contribute to the Company's success. Please be honest with us. If you don't know the answer or don't understand a question, please say so.

In conducting an assessment of a complex 'high tech.' Organisation such as yours it would be most unusual not to encounter some problems or areas of concern. If we do find problems we will document them as 'NCNs'. Minor problems should not prevent us from recommending approval but where major problems exist a deferral of approval is necessary until the problem is resolved.

Our promise to you is to be 'firm, but fair'. We share your wish that the assessment should be successful. Between now and the assessment it is up to you!.

ROGER WOOD  
February 1994

For each of the twenty clauses we must establish a quality system clearly defining:

- What has to be done.
- How it will be done.
- What records must be kept.
- How the system will be audited.
- Who will be responsible for key aspects of that quality system.

These requirements are laid down in a series of documents with, at **Level 1**, the Quality Manual including the Quality Policy and Organisation; **Level 2**, the procedures which define what must be done, and, at **Level 3**, the Work Instructions which describe how the tasks are to be performed. (See Fig. 1). It is essential that we all know where the documents applicable to our work are to be found and that we are using the latest issue.

ISO 9000 requires that we are able to describe what we do. We must be able to justify what we do by referring to the related procedures, work instructions or recognised skills. We must also be able show that what we do follows the procedures and work instructions and that, where required, we keep up-to-date records to monitor and control the quality of our work.



Fig. 1 Quality Documents



# THE BASILDON EXPERIENCE



At a special presentation ceremony at Sensors Division, Basildon, LRQA's Director Jim MacKenzie presents GEC's Chairman Lord Prior with the ISO 9001 Certificate.

SENSORS DIVISION achieved the International Standard ISO 9001 in July 1993 and has subsequently passed the first six monthly surveillance. This goal has been achieved only through the total commitment by ALL staff on the Site.

Numerous changes have been made to the old AQAP system to meet the ISO Standard. In particular, in addition to the basic quality requirements, the ISO Standard specifically looks for management involvement through reviews and the efficient clearing of audits and customer complaints. There is a clear emphasis on corrective actions and, more importantly, on prevention.

The new assessment also covers all activities within the organisation – civil aviation and commercial activities, as well as military. Functional/Departmental terms of reference, responsibilities and training must be defined throughout the organisation to identify all activities and ensure staff are trained adequately.

As part of its preparation process, Basildon restructured its quality procedures into functional manuals with the managerial heads taking personal ownership for the appropriate procedures. In the high skill areas these procedures are often supplemented by Work Instructions which reflect the finer detail of working practices.

Special Working Parties, led by functional managers, developed the procedures and work instructions. These Working Parties ensured that the procedures reflected the actual working practices of all sections

in the Company and that they met the requirements of the ISO Standard. Throughout this process, the Working Parties' objectives were to improve procedures and work instructions; to develop a site baseline and to identify and 'plug' any gaps found in the system.

The Working Parties are overseen by the 'management reviews', formed and chaired by the functional directors and senior managers. By constantly reviewing procedures and focusing on continuous improvement these management reviews have continued to play a major role in maintaining momentum in the Division.

The Division then built a record to clearly demonstrate to the Assessment Team that the procedures and work instructions were being followed.

After many months of intense activity from the entire workforce – which included the preparation of the work instructions and procedures, a Company-wide programme of ISO 9001 Awareness Workshops, numerous articles, memos, tannoy messages, and a four page hand-out to all employees – Sensors Division was ready for the Assessment.

Despite the pressures and hard work, the team effort needed to achieve our goal has brought many benefits. The Division has critically reviewed its procedures and practices, and has developed a system to continuously improve all aspects of the business via the management reviews. The strengthening of Sensors' baseline quality management system will enable the Division to focus its total quality programme on greater continuous business improvement.

# THE ASSESSMENT PROGRAMME ITSELF

By now you will know that the ISO certification this year will be different from the three-yearly visitations we have become accustomed to. There is now a world-wide trend for quality systems to require certification to international standards such as the ISO 9000 series. One of the best known accreditation organisations, and indeed the one most frequently used by aerospace companies, is Lloyds Register Quality Assurance (LRQA) Limited and we have now contracted with this Organisation to assess the Company in July this year.

The programme of events leading to the actual assessment includes a series of preliminary assessments carried out by LRQA in February, followed by a formal desk-top review at the end of April.

The preliminary assessments are a consultancy service and have no direct bearing on the assessment. They do allow us a valuable opportunity to meet the LRQA team leader and gauge our state of preparedness. The desk-top review is Stage 1 of the formal assessment however.

It involves the team leader and software assessors reviewing the adequacy of our documented system within each Division against the requirement of the ISO 9001 standard.

Stage 2 – the assessment itself – covers the Rochester sites during the first two weeks of July followed by Edinburgh, Milton Keynes and Donibristle in the second fortnight. Typically five LRQA assessors will spend two days assessing a Division, but schedules will become clearer as we progress.

There are some immediate concerns and not least of these is the increasingly urgent need to review and rewrite our documentation. This has become out-moded due, in part, to our recent reorganisation, and also because it was written to particular customer requirements (such as AQAP-1). However, we do not need to become over zealous in this activity. In simple terms, what is really needed is to document what we do according to the requirements of ISO 9000. Remember the Quality Assurance Departments are there to give any guidance you may need.

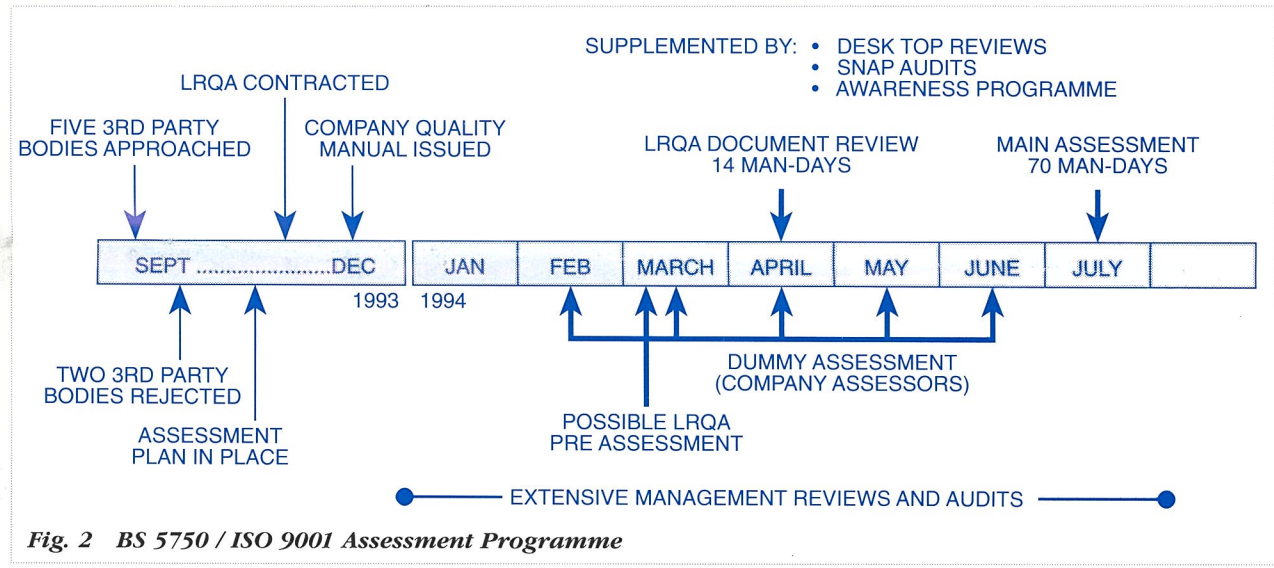


Fig. 2 BS 5750 / ISO 9001 Assessment Programme



Lloyd's Register  
Quality Assurance

## CERTIFICATE SCHEDULE

This is to certify that the Quality Management System of:  
**GEC Marconi Avionics Ltd - Sensors Division**  
**Basildon, Essex, U.K.**

has been approved by Lloyd's Register Quality Assurance  
Limited to the following Quality Management System Standards:

ISO 9001-1987 EN 29001-1987 BS 5750:Part 1:1987

The Quality Management System is applicable to:

Studies, design, development, manufacture, programme management and associated documentation of airborne communication and navigation systems; radar sensors for range and velocity measurement; infrared and visual band sensors and systems for weapons guidance, tracking and surveillance; radiolinks; electrical/optical systems and components such as day/night sights and night goggles and processing and analysis of data relating to the above technology including design and development of associated embedded software in accordance with TickIT. Support services relating to the above covering post design provision of spares, servicing, installation support and repair, including other manufacturers' airradio equipment.

Approval  
Certificate No: 912534

Original Approval: 9th September 1993

Current Certificate: 9th September 1993

Certificate Expiry: 31st July 1996



on behalf of LRQA

The approval is subject to the company maintaining its system to the required standards, which will be monitored by LRQA.

Basildon's ISO 9001 Quality Certificate.

## LIFE AFTER JULY

There is a danger that, after the initial assessment has been completed in July, the culture then in place will crumble away as the pressures of the assessment recede into the past. However, surveillance visits by the assessing body will take place every 6 months so **this must not happen**. The ISO system means all departments must carry out regular audits to ensure that the procedures laid down are maintained. Although not as extensive as the main assessment, the six months visits are very thorough and can total up to 25% of the time the assessing team gave to the original exercise. In addition they aim to re-address areas where the earlier assessment indicated weaknesses as well as monitoring the Company's continued commitment to the Standard. Whilst all twenty of the original clauses can be reviewed, four must be covered at each surveillance visit:

- Management Responsibility.
- Quality System.
- Corrective Action.
- Internal Quality Audits.

It is possible to pick up a major deficiency during these surveillance visits and lose certification.

For the provisional surveillance programme we will be visited by LRQA in January 1995, July 1995, January 1996 and July 1996. In January 1997 the visit will take the form of a document review and planning for the next re-approval in July of that year.

It is not adequate to be committed to our existing procedures once we have established them. A fundamental theme of ISO 9000 is continual improvement within the organisation. It can not be assumed that, because both a particular process and the system used to control it were approved at a previous assessment, there is now no possibility for change. Process requirements may change or ways may be found to improve effectiveness. Change will also occur in the ISO itself - there will be a document update in the early part of 1994, with a further, more significant, update anticipated in 1996.



## FLIGHT SYSTEMS DIVISION

Probably the greatest factor in our continued competitiveness and performance is the quality of our products and services.

Certainly, satisfying the increasing demands and expectations of our customers is the challenge for our continued success.

All customers require assurance that the quality systems we operate are rigidly practised, throughout all the departments and operations in our organisation. They must be kept up to date, clearly documented and understood by fully trained staff. Whilst some customers impose specified requirements, the imposed standards of ISO 9000 series represent an excellent, broad based, auditable and self sustaining set of core quality disciplines, with the greatest worldwide acceptance.

ISO 9000 approval is essential for continued MoD contracting, and the acceptance of the standard is spreading through Europe and the rest of the world. Relatively minor additions or changes to this standard will allow us to fulfil the particular requirements of the US DoD and the equally important Preferred Supplier programs of MDA, BAE, Lockheed, Boeing, Airbus and other major customers. Satisfying these vendor rating systems is very



**John Colston**

critical to maintaining our share of their future business.

The methodology of the ISO 9000 series requires continual review, thus encouraging the essential process of continuous improvement.

The need to create simpler and clearer procedures, accurately representing current practices which are understood and 'owned' by those who operate them, is our challenge.

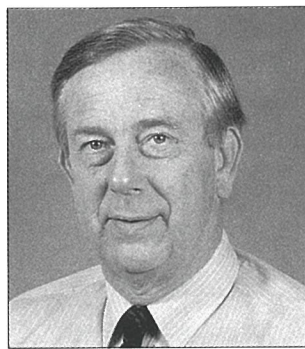
If we achieve a fraction of the benefits some companies are already claiming as a result of adopting ISO 9000, we will be making significant movement towards becoming a more efficient, harmonious and customer orientated workforce.

Considerable faith, commitment and effort is needed to achieve an approval and to maintain its benefits. The key is that we all recognise that customer satisfaction is the only way to success and growth.

## RADAR SYSTEMS DIVISION

Radar Systems Division operates in the military and para-military market. We compete directly with all the radar companies in the world, some of which have the benefit of indirect Government support, lower labour costs and a protected marketplace. Our competitors set the winning standards and our customers set the performance and, hence, technical needs. We have excellent and highly skilled staff and access to the best technology. The trick is to use our skills and technology, both in development and manufacturing, to better the opposition in meeting customer needs more effectively, quickly and cheaply.

We must set common standards, follow the most efficient procedures and make sure all of us know and understand them. Quality is the responsibility of every single one of us and will be built into everything we do. ISO 9001 sets the framework against which to establish and maintain a Quality System. We have now established a process for reviewing and overhauling our system to meet the ISO 9001 standards. I am totally committed to ensuring we achieve these standards but success will involve every



**Bill Morgan**

single member of RSD's staff. I urge each and every one of you to take an active part in its attainment and maintenance. Only this way can we be winners in a world market.

### RADAR SYSTEMS DIVISION QUALITY POLICY

Our aim is to achieve Customer satisfaction by delivering our products and services to agreed specifications and schedules at a competitive price. We will achieve this with the active support of our employees and suppliers and by retaining the good opinion of the community. We are also committed to a process of continuous improvement to keep our lead over our competitors and maintain and expand our customer base.

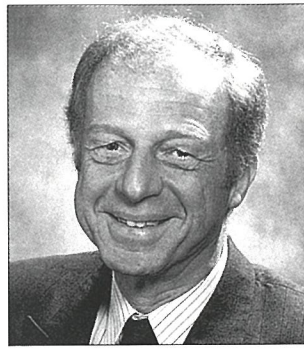
## DISPLAYS DIVISION

We, as a Division, operate primarily in the military marketplace. With defence expenditure cut-backs being seen around the world, this is becoming an increasingly competitive market in which to win business. To compound this, the worldwide financial recession has caused some countries to tighten their market controls and make it more difficult for foreign businesses to compete.

It is against this background that we face the greatest challenge in maintaining our dominant position within the industry. To achieve this we need something very special to offer - namely, Excellence. By targeting ourselves for excellence, we can offer technological supremacy; competitive pricing; high reliability and first class customer service.

We can achieve these targets. Already we employ some of the most capable people in the industry and we enjoy a good reputation worldwide. It is on this solid foundation that we must build a new culture geared towards continuous improvement.

ISO 9001 requires Displays Division to establish and maintain quality systems across all areas of our activity through regular, structured management reviews. It provides a framework to build our business around and measure our performance against. It lends itself ideally to the concept of continuous improvement and is of prime importance in securing our future.



**Peter Kenyon**

A great amount of work has already been carried out in preparing for the ISO assessment and still more has to be done. You can be assured that you have my full commitment, as your Divisional M D, to achieving ISO 9001 approval and building a future for us all.

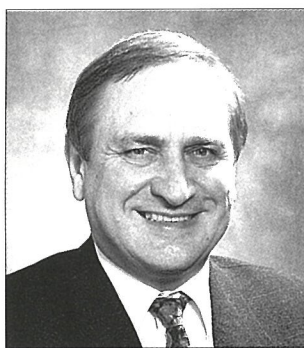
### DISPLAYS DIVISION QUALITY POLICY

It is the policy of Displays Division to seek excellence in customer service through the free exchange of ideas, open management style and a culture geared towards continuous improvement. This is effected by implementing Total Quality Management Principles from initial concept through contract negotiation, design and manufacture to after sales service. Through this policy Displays Division will retain its reputation as a world class supplier to industry by producing affordable, high quality solutions to customer requirements.

## NAVIGATION & ELECTRO-OPTIC SYSTEMS DIVISION

Navigation and Electro-Optic Systems Division, occupying the Silverknowes and West Shore Road sites in Edinburgh and with a Machine Shop located within the Crewe Toll factory, employs a staff of 1300 in the design and manufacture of Inertial Navigation Systems, Laser Systems, Electro-Optic Systems and Industrial Electronics. Export markets account for nearly 50% of Divisional turnover.

Growth is forecast over the next four years in all areas of our business, based on a strong product portfolio of advance technologies which has been positioned to meet market requirements. However, we must achieve that growth in an increasingly tough environment. In the past our Customers have accepted the quality of our products, however we now face ever tougher demands to prove the quality of our systems. These demands are not just for product quality, but relate to every aspect of the service we supply to our customers. Our whole operation must be seen to have a quality system which ensures a consistently high standard and provides a



**Les Butler**

framework for continuous improvement. The ISO 9001 assessment in July will be a test of that framework.

We have major opportunities, built on our recent orders for TIALD in the USA and many other countries. Orders are anticipated for RLG systems where we have submitted bids worth in excess of £30m. Our Product Development activities on Infra-Red Counter-Measures technologies have positioned us strongly to take advantage of emerging markets in the US and UK. Commercial business based on Power Convertors and Rotary Mirror Scanners will contribute to our overall growth and the first

deliveries of Channel Tunnel Night Stock passenger information systems will be made this year. Our registration to ISO 9001 is essential to fulfilling and sustaining these business opportunities.

### NESD QUALITY POLICY STATEMENT

In NESD the quality of our products and services will be continually improved by ensuring that every element of our Business Plan is controlled and optimised to the satisfaction of external and internal customers.

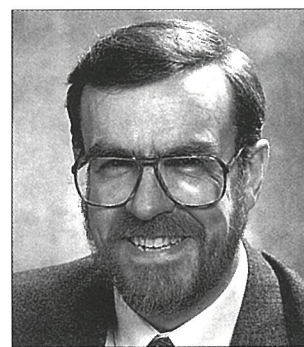
We will, by teamwork, eliminate all barriers and defects which prevent the successful achievement of our business goals. We will work in partnership with our Suppliers and Customers to encourage innovation and to improve relationships to our mutual benefit.

We will have an effective and economical quality system which is understood and implemented by everyone within the Division.

## SUPPORT DIVISION

Support Division is the largest concentration of Civil and Military Product Support resources and capabilities in GEC-Marconi. In addition to Avionics products we provide a wide range of Reliability, ILS, Repair and Overhaul and Preventative Maintenance services to customers within and outside the GEC-Marconi Avionics organisation. Traditional customer support and development of equipment upgrades are available, if required, as well as Test Systems for a wide range of electronics systems.

We occupy three UK sites, two in Scotland and one in Rochester, as well as a growing presence in GMAV Inc. in Atlanta. This multi-site UK organisation will pose a challenge when the ISO 9000 assessment takes place



**Doug Bennett**

in July 1994 because each site has its own history and customary practices.

Aligning all parts of the Division behind a customer focus provides the required unification and detailed decisions have, therefore, been made to reinforce this structure. Each Site will operate with general commonality of procedures with their geographic

neighbours and will develop an intra-Divisional approach that will integrate activities where necessary.

Therefore, our approach is to ensure that, at each site, we have an adequate set of procedures, contained within a workable documentary structure and that there is neither duplication, nor gaps. We will be required to supply clear documented evidence that these procedures are being worked in advance of the July audit.

The primary focus of ISO 9000 is towards the fulfilment of our customer's requirements. With major customers within and outside the Company, we must pay particular heed to tracking and fulfilling all customers' needs, including the tracking of deviations and their resolution.

Produced for GEC-Marconi Avionics' Quality Council in association with the Publicity Department and Support Division at Rochester.

Further information can be obtained from the respective Quality Departments in Rochester and Edinburgh.

VISION Issue 5 is scheduled for publication in April 1994.