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**International Fertilizer Industry Association** - Secretariat: 28 rue Marbeuf - 75008 Paris - France
Tel. +33 1 53 93 05 00 - Fax +33 1 53 93 05 45/47 - ifa@fertilizer.org - www.fertilizer.org

# ISO 9002 FOUR YEARS OF CERTIFICATION

**D.C. Thompson**
**ICI Fertilizers, United Kingdom**

## *RESUME*

*En 1990, ICI Fertilizers ont obtenu la certification suivant la Lloyds Register Quality Assurance sous le N0 ISO 9002. Cet exposé décrit le travail qui a conduit à l'enregistrement, la structure des procédures documentées et les améliorations mises en oeuvre au cours des quatre dernières années. Les bénéfices de l'enregistrement sont examinés. La révision 1994 de ISO 9002 sera discutée et les différences par rapport aux normes de 1987 seront mises en lumière.*

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## 1. WHAT IS ISO 9002?

### 1.1. Introduction

ISO 9002 is an International Standard - a few words about such documents will help to set the scene. International Standards are produced by the committees which work under the control of the International Organisation for Standardisation in Geneva. In this sense ISO 9002 is no different to any of the other standards which have been produced.

Other standards are specifically relevant to the fertilizer industry and are mainly concerned with sampling and analytical procedures for use in international and national trade. As a good example of this type of standard I have chosen ISO 8157 - Fertilizers and soil conditioners - Vocabulary. This is one of the standards produced by the ISO Technical Committee TC 134. The various sub-committees which comprise TC 134 are made up of experts in fertilizer technology and I have occasionally attended some of such meetings on behalf of our National Standards Body.

The present position of ISO 8157 is worth describing. All Standards are considered on a 5 year routine cycle and the Standard is circulated to the appropriate Member Bodies who vote as to whether it should be re-confirmed without revision, revised prior to reissue, or withdrawn. ISO 8157 has recently been circulated for comments and could suffer any of these fates. The UK Member Body has voted to revise the Standard as there are several technical terms which are not defined in the areas of fluid fertilizers and sampling. At the time of writing this paper the votes from other countries are not known so the future position of ISO 8157 is not known. On the other hand, the ISO 9000 series were considered in 1992 and it was concluded that all the Standards should be revised prior to reissue, the nature of the revisions will be discussed later in this paper.

These International Standards are also released as National Standards by the National Standards Bodies which comprise ISO, for example AFNOR will issues parallel French Standards. The National bodies can also issue National Standards for other methods etc which are required within their country but which are not available as ISO Standards. CEN the European Standards Body can also issue ISO Standards as CEN Standards, and additional standards as required by the European Member Bodies of CEN. This can lead to confusion and this is why there are strict rules to govern the inter-relationship of the various bodies which create Standards.

Whereas much of the work of TC 134 is now complete and many standards have been issued in the field of fertilizers, other areas of standardisation are still very active.

## 1.2. The ISO 9000 Series

The area of standardisation of quality systems is a very active area of standardisation under the ISO committee TC 176 and its national counterparts. The National Bodies are supported by experts from a very large number of interested parties - the UK has the support of over 60 organisations. This TC was responsible for the production of the ISO 9002 standard as one of a series of Standards for Quality Systems. The 'ISO 9000' series includes a number of standards.

ISO 9001 Quality Systems - model for quality assurance in design/development, production, installation and servicing.

ISO 9002 Quality Systems - model for quality assurance in production and installation.

ISO 9003 Quality Systems - model for quality assurance in final inspection and test.

Other related standards refer to:-

- Quality vocabulary (ISO 8402)
- the guidelines for the selection and use of these standards (ISO 9000-1)
- auditing of the resultant systems (ISO 10011-1, -2, and -3)
- measuring equipment (ISO 10012-1)
- and the development of the manuals (ISO 10013)

It is not the purpose of this paper to make the reader proficient in the whole range of such standards.

It was mentioned earlier that all ISO Standards must be issued as National Standards by the ISO Member Bodies. This can lead to confusion as all the National Standards are identical, but their numbers are different in the different countries. The following are some of the identical National Quality Standards:

- BS 5750 (United Kingdom)
- EN 29000 (CEN countries)
- AS 3900 (Australia)
- IS 10201 (India)
- UNE 66900 (Spain)

(Space does not permit a full list - and it would not be particularly enthralling!).

## 1.3. Why ISO 9002?

The first question which needs to be addressed is - 'Why Quality Assurance?'. As a chemical company ICI had already started down the 9000 road, partly as the result of customer pressure and had seen the benefits over previous systems including Quality Control. Quality Control provides the manufacturer with the confidence that his product meets specifications, but Quality Assurance goes much further. It allows the customer to have confidence that his requirements (which includes specifications as only one of his real requirements) are being met - and will continue to be met. Other methods could potentially be used to achieve the same result, but 9000 gives other benefits - one of the main ones is that the system is independently assessed - this removes the problem that introspective systems can bring.

The main benefit? Continuous improvement! We are not the only company to have found this. Other people have listed continuous improvement as one of the tangible benefits. To quote from one particular company, Union Carbide (1) found in addition:

- enhanced customer relationships
- reduced off-spec product
- reduced complaints
- reduced returns
- reduced external auditing from the FDA (not applicable to fertilizers, but certification to 9000 can be usefully used in discussions with any relevant regulatory authority to demonstrate process control).

Continuous improvement is possible because the system recognises problems, addresses them, and captures the solution in a form which is retained for the future - the same mistake is not then made for a second time. This is a realistic aim and can be achieved. Nobody is perfect - it is possible to make the same mistake twice, but only if the first solution was imperfect - a second and better solution is then needed!

Having said that the use of the '9000' Standards bring benefits to the company, it must be remembered that there are other systems which are related to Quality Assurance, such as Total Quality Management (TQM). TQM can be regarded as supplementary to the aims of 9000 - many papers and books have been written about the various styles of TQM, these are outside the scope of this paper.

Because of the real benefits which had been gained by those parts of ICI which had achieved certification to one or other of the ISO 9000 Standards, a policy decision was made that all products and services were to be certified within ICI. Fertilizer plants were therefore included in the programme of work.

When we looked at the options of the three Standards we decided to follow 9002.

Although ICI has design and development activities, these are on a corporate basis rather than being solely dedicated to the fertilizer activities. The 'design' clause of ISO 9001 was therefore inappropriate for our fertilizer plants. On the other hand the Engineering function decided to seek separate certification to ISO 9001, and this has been achieved.

Also our fertilizer business is not in the position of supplying an after-sales service (such as that provided by, for example, a supplier of domestic appliances). Therefore the 'servicing' aspect of 9001 is also inappropriate.

If 9001 is inappropriate, what about 9003? It would be perfectly practicable, one would think, for a fertilizer plant to rely upon 'final inspection and test'. However, many people recognise the benefits to be gained from a broader approach to Quality Assurance. Specifically there are several clauses of 9002 which are omitted from 9003 - it is not just a simple matter of concentrating on the final testing of the product.

The missing clauses are (for their detailed interpretation see later in the paper)

Contract Review (How else do you know what the customer wants?)

Purchasing (How else do you know you have the correct raw materials?)

Process Control (How do you prevent mistakes before you make rejects?)

Corrective Action (How do you prevent mistakes from recurring?)

Internal Quality Audits (How do you know you have got your systems right?)

(The examples in brackets are not meant to be exhaustive - only examples).

The scope of ISO 9003 can therefore be seen to be very restrictive. We concluded that if we followed 9003 we could not know that we were in total control whereas 9002 could satisfy all our requirements - certification to ISO 9002 was set as the target.

### 1.4. The Clauses of ISO 9002 (1987)

The following section is intended to be an overview and is not a full and detailed description of the Standard - many excellent texts exist, but I have deliberately excluded references. This is for two reasons. Firstly I would not like to imply that some references are specifically preferred by myself or by ICI. Secondly, in this area there is no substitute for experience, and the best way of obtaining information is to talk to the experts - either an experienced consultant who has a proven record in helping with successful certifications, or one of the bodies who can perform the required certification audits - most of these offer pre-certification training and advice - preferably the body which you have chosen to perform your own certification - they are on your side - and on the side of the Standard.

There are 18 clauses in ISO 9002. They cover all aspects which are required to demonstrate the suppliers capability to provide Quality Assurance in manufacturing. I have personally found that the structure of the standard is difficult to follow and I have therefore tried to simplify the structure as a "fishbone diagram" in **Figure 1** - which I hope the reader will either find easier to follow. Please note that the whole process both starts and ends with the customer: this is one of the most important points about Quality Assurance and cannot be over-emphasised.

The figure draws the clauses together into common themes - I have chosen People, Production, Purchasing and Systems - Contract Review forms a separate area in its own right. In practise there is appreciable overlap in some areas. I have tried to give a brief description of the relevant clause in the Standard, because of its importance or because there is a particular wording which needs to be explained.

#### 1.4.1. Systems

The systems are the documented procedures, the records of work etc. As such they form a separate section in their own right, but in addition they control all activities in the other sections. They are normally available at the place where they are to be used in written (typed) form although some areas have adopted computer-based systems with a 'paperless' office. All documents must be 'controlled' - this means that the user must only be able to use the correct and up-to-date version (revision) of the correct method to do the particular task in hand. We do not permit hand-written amendments to typed documents.

A system is required for 'corrective action'. This is a mainstay of the Standard (and is not in 9003). When a problem is found, either one with a product made by the system or with the system itself, the defect must be corrected. It is important to ensure that the root cause of the problem is found and corrected in order to prevent a recurrence. This may be as simple as re-writing the system to reflect an improved method which has been found by one group of operators so that all those who are involved can benefit from the improvement.

Statistical techniques are optional. The Standard defines their use as 'where appropriate' - it is still worthwhile to consider their use, rather than to reject them as a 'bolt-on extra' as they can be very useful in monitoring production - there are many useful techniques. Do not be put off by the well known 'You can prove anything with statistics'. This is totally untrue - you can actually never prove anything with statistics.

#### 1.4.2. People

There are responsibilities upon people at all levels in the organisation from the Chief Executive who is responsible for the provision of policy, through all levels of (trained) staff who are required to perform the necessary work.

One extra person must have his job defined. That is the role of the Management Representative. The Management Representative (often known as the Quality Assurance Manager - QAM) is the person who has defined authority and responsibility for ensuring that the requirements of the Standard are implemented and maintained. This may be a full or a part time job. In the time leading up to certification it can certainly become a full time job, but once the registration is in place then the QAM may either take on other registration work (for other products, for example) or he may have other types of duty - I was going to put 'other unrelated duties' but since Quality Assurance is universal, 'other' duties will still relate to Quality Assurance!

I have included 'Internal Audits' in this area of the figure (remember that these are not in 9003). These are usually performed or at least controlled by the QAM, but if his other duties are such that require audit, then someone else must perform this particular audit.

A good example of this is in the audit of the Management Systems - ie the work of the QAM. The QAM cannot audit himself! In a large organisation there is not a problem - I have been audited by other QAMs and auditors from other sites. In a small organisation there needs to be a provision for an outsider, a consultant is always available at a price.

Training is a fairly obvious area for control and is self-explanatory.

Management Review needs a few words - this is a scheduled meeting at which the most appropriate Senior Manager reviews the performance of the systems with an appropriate management team (it is up to the management to define the review process which is most suitable for the registration). The continuing suitability and effectiveness of the system is reviewed. This is the time for management to step back from the operation of the system and have a look at the way in which the system is working.

### 1.4.3. Purchasing

Much of the 'purchasing' area is comparatively self-explanatory. Two clauses cause some confusion.

The term 'purchaser supplied product' is more commonly known in industry as 'free-issue' material. The term is used to describe a material which is processed on behalf of a customer. If the customer were able to buy a fertilizer component at a very good price then he may be able to give this to a compounder for processing into a finished fertilizer. This is not likely in the fertilizer industry, if you don't do it then all you need to do is to say so!

The control of purchased services such as subcontractors is an important area. They must be controlled in some ways as closely as your own operations. If you use a contractor, for example, for calibration of your plant instruments, then you need assurance that he has calibrated his own equipment that he used for the work. Is the contractor certified to ISO 9000? The phrase 'calibration traceable to National Standards (of measurement)' such as the International Kilogram is often used and is self-explanatory.

### 1.4.4. Contract Review

I have left contract review as a separate area as it does not fall neatly into one of the other areas and in addition it forms a separate, highly important, activity in its own right. It requires you, as supplier, to know what your customer wants you to supply, and that you can achieve his requirements. A simple example in fertilizers is the meeting of the relevant analytical tolerances laid down by the national legislation of the customers' country - but you also need to know all other specification parameters - good storage characteristics, granule strength, particle size .....

This is another clause which is missing from ISO 9003.

### 1.4.5. Production

By the phrase 'production' most people who attend the IFA Technical Conference (for whom this paper is written) can readily relate to the operation of a manufacturing plant with a product coming out in bags etc and which is then put onto wagons for sale. It is worth pointing out that it is not necessary for the 'product' to be so tangible. Other firms have used the 9000 series of standards for the certification of accountancy firms, supply of computer software, catering, and education, to quote only a few disparate examples to augment the wide range of more obvious 'products'.

In more familiar terms, process control relates to the way in which you control your operations to achieve the end result that Contract Review has shown that you require to meet. The clauses in this area are the steps along the processing route from raw materials to final delivery to the customer.

Most of the clauses are self-explanatory to those familiar with a manufacturing plant and I will not enlarge upon them at this stage.

The term 'Special Processes' refers to processes where the product cannot be fully tested, for some very good reason, before the product is used. We found that we had to regard part of our production as 'Special' where the product from one plant could be sent by pipe to a downstream plant and used before all laboratory analyses were completed.

## 2. WHAT IS CERTIFICATION?

In simple terms this is the issue of a registration certificate such as that in **Figure 2.** This is our present certificate for our fertilizer operations which are registered with Lloyds Register Quality Assurance Limited (LRQA). In order to obtain such a piece of paper from LRQA certain criteria must be met.

Firstly LRQA must themselves be accredited. In the UK, accreditation is performed by a national body known as NACCB, other countries' bodies as examples are DAR in Germany and RAB in the USA. Accreditation shows that the certification body has itself been examined by an independent body against the relevant criteria in the appropriate part of the Standard. This does not mean that the body has achieved certification to ISO 9000 itself, although this is seen by some as a logical step forward (2). The presence of the NACCB 'tick and crown' mark shows that LRQA were accredited to perform a certification audit on ourselves. Other bodies are similarly accredited, although it is a wise precaution to check that a particular body are accredited before you employ them on your behalf.

Secondly, LRQA reviewed the documentation that we had produced and checked to see that all the clauses of the Standard had been adequately covered in the material which we had written.

Finally, and most importantly, they checked in a detailed audit to verify that we were actually following all the procedures. In performing this audit they were not restricted in any way - they could go anywhere and talk to anybody.

This reflects one of the benefits of QA, although somebody such as the QAM usually accompanies the external assessor for continuity, it is the people who actually use the procedures that participate in the assessment. It is no good if the QAM understands the procedure unless the user knows it even better.

Following this process, and internal checking of the assessors reports at the headquarters of LRQA we received our first certificate. If you look closely at the present certificate you will see that it has been re-issued after a three year period. This followed a process similar to the original process described above. This re-registration process is not used by all accreditation bodies. Between these major audits LRQA perform scheduled audits every 6 months.

On the subject of external certification, the UK operate a system whereby assessors themselves (as individuals) can be independently qualified and registered by the Institute of Quality Assurance. We have not used this scheme for our fertilizer auditors, but rely upon separate independent training and on-the-job practise. If we offered our services outside of ICI the IQA scheme would have been used.

## 2.1. What Is Certified?

There is sometimes some confusion over the precise product or service which is actually certified. All confusion can be simply removed by asking to see the suppliers certificate, once again please refer to **Figure 2** which shows our certificate together with a schedule of sites.

The headquarters staff at Wilton provide all the central services such as raw material ordering and supply, packages, order taking for products. They also operate the control of transport and storage of the product in depots - the "subcontract warehousing and distribution" shown on the certificate.

Both Billingham and Severnside manufacture the final product. At Severnside we have ammonia and nitric acid plants which are dedicated to fertilizer use; they are included in the registration whereas the Billingham plants for ammonia and nitric acid are excluded because they supply external customers as well as the fertilizer plant.

Firstly, it is not the product (prilled ammonium nitrate and associated fertilizer blends) which is certified, but the manufacture of the product. This is sometimes interpreted by those who are not familiar with the requirements of the Standard that any manufacturing process can be certified - even if the product it makes is of unacceptably poor quality. This is untrue. It may be possible for an unscrupulous firm to obtain a certificate for such a product but a good auditor would then only maintain the registration if that was the product that the customer actually wanted.

i.e. low quality + low price = satisfied customer.

The auditor would still be looking for the achievement of continuous improvement: he would examine customer complaints, how they are investigated and if they are being progressively reduced.

Secondly, it is only the product (or products) which are listed on the certificate which are covered. If we had a third manufacturing site, such as the plant we used to have in Scotland, it would not be included. Similarly the manufacture of granular NPK fertilizers is not included. We used to operate these other plants, but they have now been closed and demolished: if we were to ever build another plant then it would have to be added to the schedule of sites, this could only be done if the external assessors had performed a rigorous audit.

## 3. WHAT IS A MANUAL?

Firstly, and most importantly, a manual is not a glossy document which is locked away in a senior manager's office and only stops gathering dust when it is brought out to impress a visitor. If a manual were ever used in this way, then registration would be pointless.

As a small point it is not necessary for a manual to be printed if every user has access to an electronic office system. I know of three areas in ICI where this is true.

A manual is not a stand-alone document. In **Figure 3,** I have tried to illustrate the way in which our manuals inter-relate. We have a single "top" manual in which I described how the Standard has been interpreted for the requirements of the fertilizer business, and describe how the Standard shall be implemented in the various areas of the business. The second tier of documents contain the operating procedures; there is then a third tier of documentation, some of which are illustrated. The third tier contains a wide range of additional documents such as:

- analytical schedules
- raw material specifications
- lists of approved suppliers and subcontractors

to name a few.

A manual must be available at the place where it is to be used, not in the senior managers' office, but in the plant control room, the order reception office, the despatch office etc. This does not mean that the manager does not need a copy, only that his use of it will be less frequent.

A manual must be properly issued (document control being an important part of the Standard). We issue controlled copies to users with paper that has the "Q" symbol (a trademark of ICI Chemicals & Polymers Limited) in blue. This ensures that a photocopy (an uncontrolled copy) is immediately obvious to the user. As uncontrolled copy will not be updated with improvements, a controlled copy will be updated because we know who holds the copies.

The manuals are the visible evidence of the quality system. On the surface they look boring but consider -

"96% of problems arise from systems and their design".

"Management's job is to improve systems - what else?".

Not ICI quotations, but W.E. Deming - regarded by many as the father of Total Quality Management.

## 4. WHAT IS A PROCEDURE?

Manuals, it has been stated above, are vital. The operating procedures that they contain (referred to by some as "critical procedures") are the bricks that build up the wall of quality. In its simplest form a procedure says what to do. This, in itself may be all that is required for a particular operation, but for a full description there are some elements which are missing:

- who does it?
- why do you do it this way?
- what do you do with the results? (records)
- what is affected by this procedure? (references)

### 4.1. What Makes A Procedure?

**Figure 4** gives an example of a procedure.

In practice most procedures contain the following elements.

**A title and a reference number**

It is important to keep the procedures in an organised system so that users can locate a procedure when they need it, and don't forget the poor auditor who is trying to locate the procedures which relate to a particular clause in the Standard.

**A purpose and a scope**

These help to define the procedure in a precise manner why it is done (which part of the Standard is addressed for example), who is to use it or, where (which plant) it is to be used.

**References**

What information was used to write this procedure? There may be various sources of information which could include legislation or industry codes of practice. There may be operating procedures which were used in writing this procedure or other procedures which rely upon it. These other procedures may need to be changed if there is a change in this procedure.

All these should be simply listed.

**Definitions**

A simple list will suffice.

Some items of jargon are superfluous and should be eradicated. Others are part of the essential language but need to be explained briefly. Some acronyms may be used several times in the procedure rather than writing them out in full every time.

**The actual procedure**
A procedure is not the same as an operating instruction.

An operating instruction would be written more in terms of ... (hypothetical example).

If the pH alarm sounds then the control room operator shall open valve V93 two turns on manual, and then check the panel reading on ARC49. If the reading has not changed then he should check the pH by taking a manual sample from the sample point on V94 ...

An operating procedure would be .....

The control room operator shall note all pH alarms in the log book together with any actions he has taken.

This enables an auditor to check

- who should perform the task?
- how can I check that the task was completed?

The procedure is therefore auditable.

**Documentation**

A reference to standard forms is useful.

If there is no information in a particular section (eg no documents) then some would suggest that "Documentation - none" should be included because it shows that you have considered the item.

## 4.2. What Makes A Good Procedure?

This is a much more difficult question to address, and there are several ways in which I would regard a procedure as "good".

Firstly a good procedure may be frequently used, this can usually be determined by looking at the procedure manual at the workplace and finding out where the wear and tear has taken place on the pages. A procedure which is particularly complex, perhaps one that concerns legislative requirements, may be a good example.

Secondly a good procedure can be one which is rarely used, but must be followed on these rare occasions. In Figure 3, I make reference to the Customs Procedures Manual. This contains procedures that, to date, we have never used, but if we were to export goods to certain countries (outside those to which we supply at present) then we must follow these procedures or we would run the risk of prosecution by HM Customs or their foreign equivalents.

Thirdly a good procedure may be the one that is always followed, but never needs to be read - until the day on which a new member of staff joins, or the day when the normal job holder is on holiday and their deputy is ill.

Finally what do you do with a "bad" procedure? You could scrap it completely because it is no longer relevant to current or future business needs - normally this would be an action by the person authorised to issue the manual: do not forget to withdraw it from all volumes of controlled copies. As an alternative it could be changed; this would normally be done by those who use the procedure, if they find that it is wrong then they can use the system to change the errant procedure. The "best" procedures are often written by those who use them.

## 5. SOME PRACTICAL EXAMPLES AND HINTS

I have tried to make the earlier parts of the paper as illustrative as possible, and the reader will find that there are several practical examples and hints in the text. To summarise some of these:

- start and finish the process with the customer
- choose the correct Standard for your needs
- get help from someone who is an expert
- address all the clauses of the Standard
- use an accredited assessment body
- get your scope right
- write "good" procedures.

Here are some further examples from our experience.

### 5.1. The Wrong Scope

When we started to register our products and services to ISO 9000 some people were trying to maximise the number of their registrations, and celebrate having a large number of registrations. Nowadays we have less registrations than before. We used to have three separate fertilizer registrations for the three sites, we now have only one.

We combined the registrations because of the problems of scope and interfaces. The production plants, for example, have no responsibility for buying raw materials nor contract review with external customers nor order taking nor .... On the other hand the headquarters staff have no responsibility for testing of product, for the inspection and test status of the fertilizer. The individual areas were therefore seen to be incomplete as they did not address all the clauses of the Standard whereas the combined business did address all clauses.

There were interface problems with the separate registrations, each registration in some respect was a customer and/or a supplier to the other registrations and work was being duplicated across the interface to recognise this fact.

Finally there is the practical aspect of ease of external audit - following the triennial re-registration and the combining of the registrations we have halved the costs of external audits. The internal audits are still pursued with the same detail as before and are in general more searching than the external audits.

## 5.2. Commitment and Enthusiasm

When people start with Quality Assurance, enthusiasm and commitment are, as with many "new" initiations, comparatively easy to obtain. But other "new" ideas have come and then vanished into obscurity. Anyone who has been around for a few years will tell you about the new ideas which have evaporated a few months after the training course has finished.

Quality Assurance is different, and the reasons are the achievement of continuous improvement with a system which can hold and consolidate the gains.

In order to maintain enthusiasm it is important that the QAM gives sufficient time to ensure that the system is improved and that those who help are recognised in some way. This can be in a small way, or in a larger system of internal Quality Awards. External awards, both national and international are open to entries.

## 5.3. The QAM Gets Things Done

Let me quote the Standard, " ..... a management representative who .... shall have defined authority .....". The job of QAM can be regarded as that of a person who is always finding faults (performing audits) and involved with a lot of paperwork (manuals, procedures etc). If this is the manner that a QAM operates then he may be fulfilling the bare requirements of the Standard, but in addition he has authority. He is not only authorised to get things done, he must get things done. He has direct access to senior management (he must be independent of the work that is being performed) and he can (and must if necessary) use senior management as a resource to the progress of work.

This may involve the QAM as a facilitator and it may be beneficial to regard him in this role and provide training in problem solving techniques, statistical control etc.

# 6. THE 1994 REVISION

When I first offered to write this paper in November 1993, it was expected that the revised Standards would be issued in the early part of 1994. Since then the probable date has receded. I have checked every 3 months and the printing date has always been some 3-4 months in the future. Since the IFA Secretatiat require this paper to be with them by 1 June and the probable date of issue is now September, I can only give a general idea of changes which are based upon the draft of the revision (ISO/DIS 9001). It is probable that there will be no major changes before the final issue, but this cannot be guaranteed. I will, of course, in my presentation of the paper give the best available information that is available in October.

The most important general point is that the changes are not radical in nature. Most of the changes are to make explicit those items which were previously implicit, but which had been adopted by most of those who had taken the Standard fully on board. A few examples of such changes

- the management representative must formally report to the management review (in practice this has always been the case in ICI)
- suppliers must document precisely how the requirements for quality will be met (perhaps there needs to be a drawing-together of information which is diffused through the manuals, but no new procedures would be expected)
- organisations must define how amendments are made to contracts (which has always been implicit)
- "purchaser supplied product" is now retitled "customer supplied product" (easier to understand)
- detailed procedures are now clearly specified for inspection and testing activities (previously implicit)
- electronic records are now explicitly accepted (we have always used them for certain data).

All these, and others, can be seen as sensible points of clarification and general housekeeping. There are, however, some points which will probably require suppliers to think quite hard, to modify their procedures and possibly to add some new procedures. Let me describe those which in my opinion are likely to be most significant.

- The clause numbering for ISO 9002 will be aligned to ISO 9001, this will aid clarification. More of the standard clauses will apply to ISO 9003. This will give more usefulness to ISO 9003, but I would still prefer to use 9001 or 2 rather then 3.
- The quality policy must now have some teeth. It cannot simply be a form of words and polite standard phrases. It must reflect the company's and customers needs - and this must be able to be proven.
- Resources in all areas may now be examined for adequacy.
- Management Reviews may need to be sharpened up.
- Verbal orders, as well as written orders must now be addressed.
- Maintenance of plant equipment must now be suitable "to ensure continuing process capability".
- Statistical Techniques used to be "where appropriate". This is now replaced by a requirement to "identify the need" and to implement such techniques. Most companies will need to study this clause when the final copy is available.

## 7. CONCLUSION

This is a personal view of ISO 9000 and does not necessarily represent ICI Policy.

This paper does not set out to make the reader into an expert on the ISO 9000 series of standards, there is, hopefully enough information to enable a beginner to understand some of the philosophy behind the Standard and to enable a more expert reader to extend their knowledge.

I have tried to describe some of the benefits. Some of the more tangible are detailed above, some of the more intangible are just as beneficial. The feeling that everyone is trying to pull in the same direction, of understanding each others procedures and therefore having a sympathy for their problem areas - these and similar non-financial incentives are, to my mind, more important than some of the financial measures. Combine the two benefits and construct a robust system and you will strengthen the probability of success for any firm. In the present state of the fertilizer business it is one factor which swings the balance away from failure towards survival.

Beyond the 1994 revision of the Standards, the next revisions are already being considered. It is expected that they will be more dramatic in their changes, and this could be a subject that IFA may wish to consider at a future Conference.

The author would like to thank the management of ICI Fertilizers for permission to publish this paper and acknowledge the valuable help and support from colleagues.

## REFERENCES

1. H Gasko Semi-Annual Conference of the Hazardous Goods Materials Advisory Group San Antonio 10.10.93.
2. LRQ Review March 94 Lloyds Register Quality Assurance Limited. DCT68E/LG

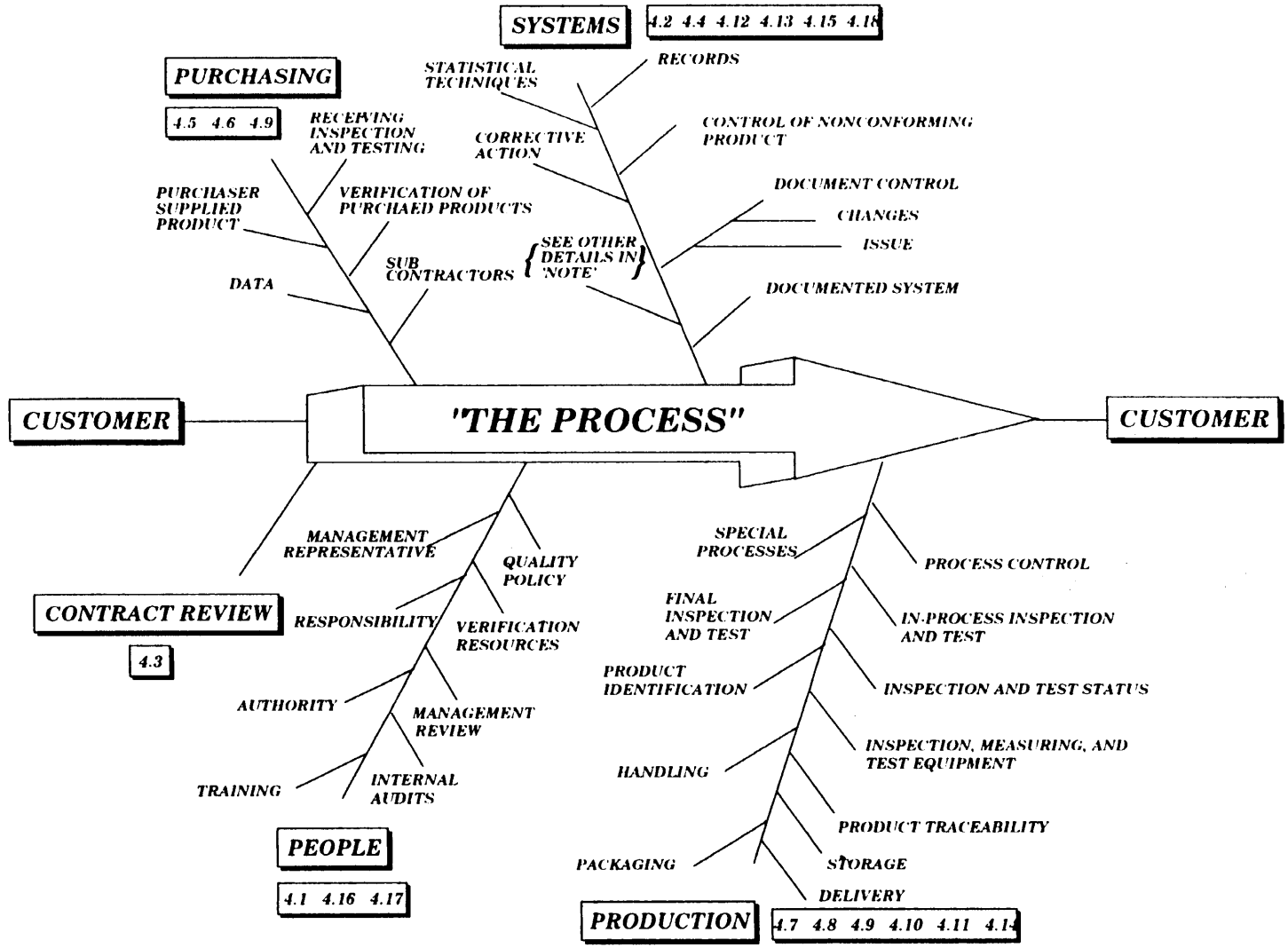


**FIGURE 1: FISHBONE DIAGRAM ILLUSTRATING ISO 9002**

# FIGURE 2: ICI FERTILIZERS ISO 9002 REGISTRATION

Lloyd's Register
Quality Assurance

CERTIFICATE OF APPROVAL

*This is to Certify that the Quality Management System of:*

***ICI Fertilizers***
***Wilton Head Quarters, Middlesbrough, U.K.***

*has been approved by Lloyd's Register Quality Assurance Limited to the following quality management system standards:*

***ISO 9002-1987 EN 29002-1987 BS 5750:Part 2:1987***

*The Quality Management System is applicable to:*

***Manufacture of prilled ammonium nitrate and associated fertilizer blends. Sub contract, warehousing and distribution of above products.***

*This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.*

*Approval Certificate No: 890882*

*Original Approval: 5th September 1990*

*Current Certificate: 28th June 1993*

*Certificate Expiry: 31st August 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.*

Lloyd's Register
Quality Assurance

CERTIFICATE SCHEDULE

***ICI Fertilizers***
***Wilton Head Quarters, Middlesbrough, U.K.***

***Head Quarters***

*Wilton, Middlesbrough*

122

***Sites***

*Portrack,*
*Billingham, Cleveland*

***Works***

*Severnside Fertiliser Works*

*Schedule to Approval Certificate No: 890882*

*Original Approval: 5th September 1990*

*Current Certificate: 28th June 1993*

*Certificate Expiry: 31st August 1996*

***Page 1 of 1***

## FIGURE 3: STRUCTURAL DOCUMENTATION

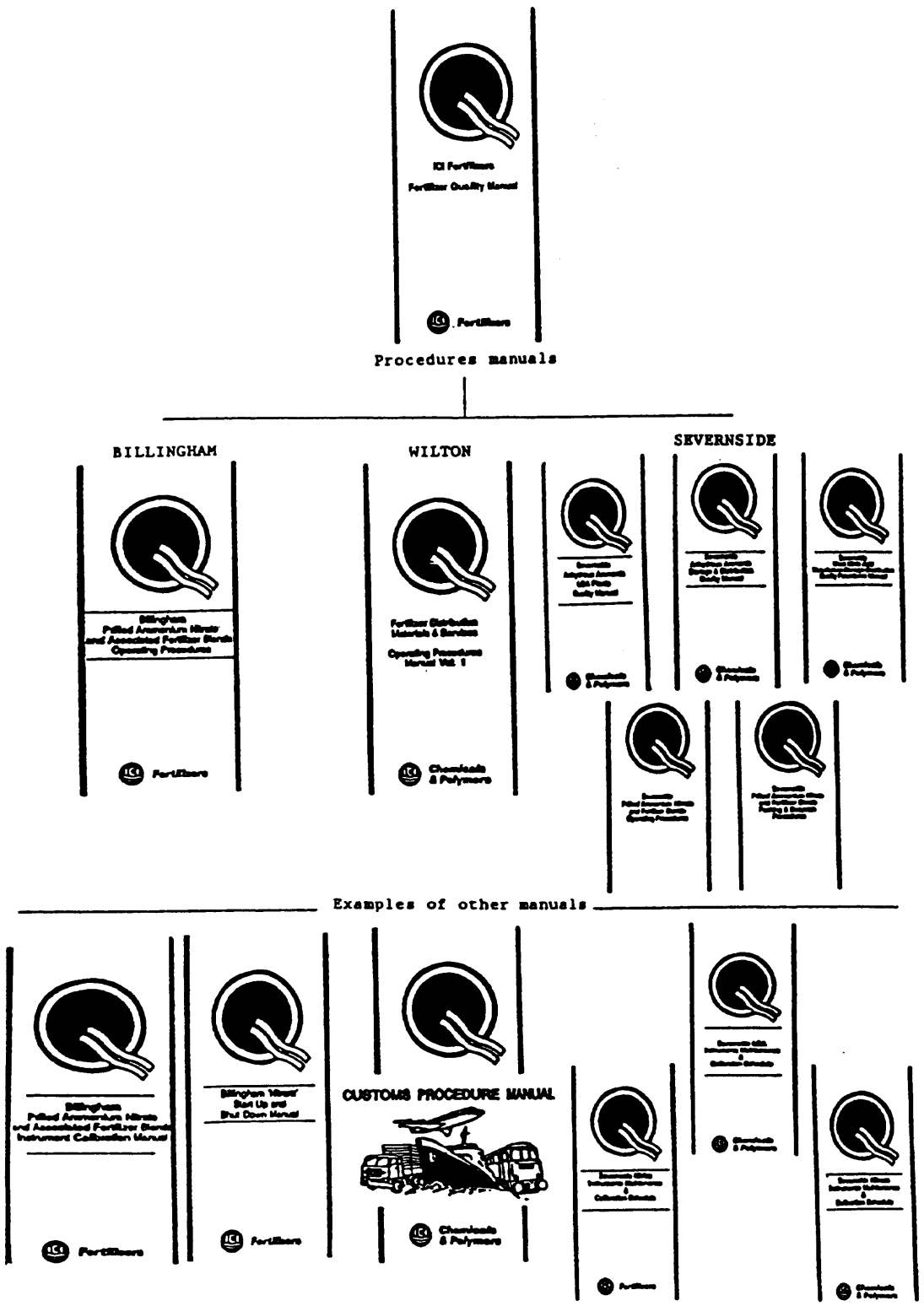

FIGURE 4


| ICI Chemicals & Polymers Ltd | |
|---|---|
| Manual Issue: 1 | Date: |
| Doc Revision: 0 | Date: 14/02/94 |
| Controlled Copy No: | 1 |

**PROCEDURE FOR WRITING A PAPER FOR IFA : DCT/01**

PURPOSE

To ensure that the paper is written and sent to IFA by the due date and that authorisation is obtained from management.

SCOPE

This procedure applies to papers written for the 1994 IFA Technical Conference.

REFERENCE

1 Letter from IFA dated 24 January 1994

PROCEDURE

1 Before confirming acceptance of the offer to present a paper for IFA, the author shall obtain outline permission from ICI management using the correct form.

2 The author shall confirm acceptance by the due date of 18:2:94.

3 The author shall write the paper in draft form and shall use his judgement to decide who should be sent a copy of the draft for comments.

4 Having received comments the author shall produce a final version of the paper.

5 The author shall obtain final permission from senior management for the paper as written.

6 The author shall send the paper to IFA by the due date of 1 June 1994.

7 The author shall file a copy of the final paper with Information Documentation Services Group.

DOCUMENTATION

ICI Approval for Publication (form issued by Information Services Manager February 1990.


*Chemicals & Polymers*