Aspects of General Conditions of Contract Which Give Rise to Dispute

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Declaration

I hereby certify that the contents of this thesis represent my own work and that the opinions expressed are my own and not necessarily those of the Technikon.

Thesis Summary/Synopsis.

The incidence of disputes has long frustrated effective management and completion of Construction Contracts. Very little material is available on the causes of disputes and how the respective General Conditions of Contract used in this country handle circumstances relating to these areas of dispute.

Causes of dispute can be divided into two categories, namely Primary Causes and Secondary Causes. The Primary Causes are Time, Cost and Quality and the Secondary Causes are Risk, Variations and Alterations, Delays, Claims, Adverse Physical Conditions, Extensions of Time and Payment. All the secondary causes of dispute are risk related and a consideration of risk is therefore of utmost importance with regard to avoidance of disputes.

To avoid disputes, risk has to be fairly allocated amongst the parties involved in the Contract. Before this can be done, however, risk first has to be identified and an attempt has to be made to reduce it. For a long time General Conditions of Contract have been used in this country which have been closely allied to British General Conditions. The General Conditions of Contract (1982) (Blue Book) is very closely allied to the I.C.E. General Conditions of Contract (4th edition). The latter contract was revised in 1979 and was generally considered to be more favourable toward the Contractor. It has become known as the I.C.E. General Conditions of Contract (5th edition). Both the General Conditions of Contract (1982) and the ESKOM General Conditions of Contract have recently been revised, and on comparison of the clauses relating specifically to the major causes of disputes mentioned previously, were found to be more biased in favour of the Employer and more closely allied to the C.S.R.A. General Conditions of Contract 1986, also widely used in South Africa.

The major reason for having drawn this conclusion is that in the case of G C C '90 and ESKOM '90, all claims have to be made in accordance with a general claims clause which involves a procedure which subjects the Contractor to unfair requirements and allocates risk unfairly on him. The General Conditions of Contract 1990 do, however, represent improvements in certain respects, namely with respect to clauses relating to Care of Works, Excepted Risks, Valuation of Variations, Monthly Payments, Time of Payments and Correction or Withholding of Certificates.

No set of General Conditions can provide a completely equitable situation and each has its pros and cons. This thesis should provide an easy reference as to which are the major causes of disputes and as to how the respective General Conditions of Contract in this country handle the circumstances relating to these areas of dispute.

It will also put forward recommendations on how disputes can be avoided and how certain clauses of the relevant documents can be improved.

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Section B of this thesis will make a comparative study of this document (GCC'90), the General Conditions of Contract 1982, C.S.R.A. General Conditions of Contract 1986, ESKOM General Conditions of Contract 1990 and the I C E Conditions of Contract 1986 (Fifth edition).

Only clauses relating to the major disputes discussed in Section A will be compared.

The I.C.E. conditions were revised in 1979 and are generally considered to be more favourable toward the Contractor now than the previous 4th edition. This thesis will attempt to establish the trend in this country, as the ESKOM conditions have also recently been revised.

The modifications to the General Conditions of Contract 1982 will be noted and where possible the practical effect of the changes will be ascertained.

An attempt will also be made to determine which of the clauses is likely to be most effective with regard to creating an agreement which avoids disputes.

Lastly, proposals will be submitted as to how these specific clauses could be improved in order to avoid disputes.

Section A - Causes of Disputes

1. Primary Cause - Time, Cost and Quality

If one has to adopt a holistic approach as to what is the root cause of disputes in Civil Engineering one has to conclude that it is the three aspects Time, Cost and Quality, since they "encompass all that fall within the scope of contract performance" [24]. These aspects are the chief concern of all parties involved in a Contract and consequently are the chief cause of all major disputes.

Time, Cost and Quality are all interdependent variables of each other. For example a Contract with a relatively short time available for completion often results in a decline in quality because of an increase in the rate of construction. For this reason it is of utmost importance to establish a balance between the three equivalent to the type of work being done.[24] Imbalance would result to the detriment of one or the other and it is thus this imbalance which creates potential for major disputes. To further emphasize the importance of these variables each will be discussed individually.

1.1. Time

Here the immemorial cliché "Time is money" is apposite. It is not too difficult to agree with this statement when one considers the volatile economic climate which is prevalent in our Country today. Thieves such as inflation and spiralling interest rates are forcing a new rapidity upon society or more specifically on the Civil Engineering Industry. Here the relationship between Time and Cost becomes apparent. Small wonder then that Employers now require contracts to be completed far quicker than ever before.

It is also in the Contractor's interest to complete the Contract in the fastest possible time since his costs are also closely related to the contract duration.

So too the Consulting Engineers who are likely to get the blame if contracts overrun their original budgets due to longer duration. Any type of delay is a nightmare to all concerned and the potential for dispute is obvious, as it is for other matters relating to time such as claims for extensions of time and the date of substantial completion.

1.2. Cost

Cost is a major consideration for all concerned since money is a prime factor for all parties involved. There are however differences in attitude to costs. [7]
The employer would like to have the work completed at the lowest cost to himself or at least within the tender amount.
The Contractor also hopes to complete the contract at minimum cost to himself but his cost is different to the Employer's in that the difference between the Employer's cost and the Contractor's is the Contractor's profit. The Contractor is not too concerned about completing the work within the Employer's budget. His chief concern is that he is paid for the work done even if it exceeds the tender sum. The Engineer also has an interest in completing the work to budget for the reasons mentioned previously and for those reasons it is often difficult for him to remain impartial with respect to claims for extra payment by the Contractor.
The potential for dispute is obvious because of this difference in attitude to costs and because no one likes losing money.

1. 3. Quality

Quality is important to all in order for the works to have a long service life and for the works to require minimal maintenance. However, there is again a difference in outlook because "in contrast to the questions of time and cost, the Contractor has no direct stake in the finished quality of the works, apart from

the reputation of his company and from this basic difference in outlook spring many of the disputes which bedevil construction contracts" [24] The Contractor, however, has a problem in that acceptability of the standard of quality does not rest with him, unlike a manufacturer who is able to test the quality of his products before marketing them. [15] The Contractor is therefore forced to a certain extent to produce the quality required. Quality is often sacrificed in order to reduce the contract time and cost creating a climate for disputes and creating the imbalance discussed previously.

1. 4. Conclusion

a) Time, Cost and Quality are the chief considerations with respect to contract performance and their interrelation is the root cause of all major disputes i.e. the primary cause.

b) The difference in attitude to the above creates potential for dispute.

c) An imbalance between Time, Cost and Quality also can give rise to disputes.

2. Secondary Causes

There are numerous secondary causes of disputes, however the purpose of this paper is to establish which are the causes that occur most often. By means of extensive research through published literature, by reference to case studies of disputes and by interviews with eminent members of the profession it is concluded that the following are the sources of dispute that occur most often - Risk, Variations and Alterations, Delays, Claims, Adverse Physical Conditions, Extensions of time and Payment. Reasons for this conclusion will be given in this chapter.

2. 1. Risk

Time, Cost and Quality all involve an element of risk.

Hypothetically, if a Contract were to proceed exactly as planned it would be completed within the allotted time, it would cost as much as was budgeted and the quality would be of the standard desired. This is however seldom the case because of the uncertainty involved in most if not all Civil Engineering contracts. This uncertainty or risk is a major consideration in the avoidance of disputes. Dr Martin Barnes [2] regards risk as "the greatest hindrance to meeting the cost, time and performance targets of projects" and consequently if risk is not carefully considered the potential for dispute is great.

According to J. F. Mc George[24] most contractual problems result because of a misunderstanding of responsibilities or because of disputes over who is liable for unforseen events or risk. One can safely say therefore that most disputes are risk related and that risk is the most important secondary source of disputes.

Mr H. C. Biersch,[9] Mr. T. Cockroft[13] and Mr. J. Newdigate[26] all regard risk as

a major source of dispute. Civil Engineering is without doubt a risky business and there will always be an element of risk involved in construction contracts, but it is critical that this risk is identified, that an attempt is made at reducing this risk and that the consequence of risk is allocated fairly amongst the parties involved. These aspects of risk will be discussed in the chapter on the handling of risk.

2. 2 Variations and Alterations

As with risk, H. C. Biersch[9], T. Cockroft[13], Dr. Barnes[4] and L. Dison[15] regard this source of dispute as one which occurs often. J. F. Mc George[24] regards variation as "a continual problem for all concerned with administration of construction contracts, and forms the subject of a vast number of disputes". According to Abrahamson[1] "most of the employment given the legal profession by engineering work is to do with disputes about variations" Variations and alterations can be regarded as the chief source of dispute in the following court cases reviewed in the "S.A. Law Reviews" and the "Engineering and Construction Law Review".

a) Mc Alpine vs T.P.A[23]

Probably the longest running Civil Engineering case in which Mc Alpine contested that there had been so many variations and alterations to the original contract that it had been vitiated or abandoned and had been replaced by "a tacit agreement brought about by conduct".

b) Richtown Construction Co. (Pty) Ltd vs Witbank Town Council and another (July 1982) [53 & 37]

The question here was whether instructions given by the Engineer amounted to variations of the agreement or not, and whether the Contractor would then be entitled to be remunerated at a higher rate than the ordinary rate stipulated in the contract.

c) Minister of Public Works vs W.J.M. Construction (1983) [38 & 54]

Here W.J.M. Construction contended that it was entitled to different rates by virtue of the extent of the increased quantities which exceeded the maximum increase of 20% (in terms of the relevant clause.)

d) Clifford Harris (S.W.A.) vs Administrator General of S.W.A (1984) [58]

Clifford Harris contended that there was an increased quantity of a certain class of material being excavated.

e) Melmoth Town Board vs Marius Mostert (Pty) Ltd. [39 & 59]

Here it was contended that 20 000 m^3 of hard rock was excavated more than the provisional quantity of excavation.

f) Grinaker vs T.P.A [61]

Grinaker charged that the quantities of various items of the works did not correspond with quantities as set out in the schedule.

Of 8 other case studies reaching arbitration, mediation or litigation, 4 of the cases had variations as the chief source of dispute. [8]

This is all overwhelming evidence supporting the theory that variations and alterations are very often the source or cause of disputes.

2.2.1 Source of variations

Variations are listed as arising from three chief sources [24]. They are:

i) Instructions from the Employer leading to changes in what is required in the works.

ii) Changes by the engineer to the design.

iii) Unforseen events, particularly site conditions.

It follows that if efforts were made at tender stage to minimize the changes discussed above, the chance of disputes arising would be reduced. Methods of

minimizing these changes will be investigated in the chapter on handling risk.

At this point we should note that "changes do not themselves cause dispute and interfere with good management. Provided the Contractor is adequately compensated for the changes to the work, they are tolerable." [2] In other words, conflict normally arises in the assessment of the variations.
Variations and alterations are risk related because ideally all parties would prefer the Contract to be completed with minimal changes but the possibility of changes occuring is always inherent.
Variations are as much part of Civil Engineering as risk, but every effort should be made to handle them in a way which avoids disputes.

2.3. Delays

Any delay in a contract always leads to an increased cost and someone has to foot the bill. Consequently, delays are often the cause of disputes. Variations are one of the causes of delays. We can now detect a pattern that suggests that all these secondary sources of dispute are inter related.
Other causes of delays are :

i) Access to site
ii) Provision of drawings
iii) Suspension of work
iv) Underground conditions (Another major secondary source of dispute)
vi) Weather conditions

In the Mc Alpine vs T. P. A.[23] case alternative claim A involved delay in the issue of drawings and instructions.
Mc George suggests that delays or disruptions are the root cause of most claims.[24] (Also one of our major secondary causes of disputes)

At this point it is convenient to summarise some of the above. Variations are one of the causes of delays and delays are one of the causes of claims and it can be safely said that they are all risk related. It becomes more and more apparent how important consideration of risk is with regard to avoiding disputes. Most delays can be prevented by better management and planning or by better site investigation as will be explained in the next chapter.

2. 4. Claims

Where there are variations, delays and unforeseen site conditions there will almost always be claims for compensation.

"Claims generally emanate from contractually defined risk sharing and are compensation over and above benchmark values covering those risks contractually to be borne by the contractor".[7] This is a very important statement and underlines the importance of an advance definition of risks with regard to an equitable outcome to a contract. Disputes and claims very often result because of imprecisely defined risk apportionment and this will be discussed in the next chapter.

Claims are also an unavoidable facet of Civil Engineering and should be regarded as normal and not as something reprehensible. A claim is most often the Contractor's demand for either extra monetary compensation or extra time or both, due to disruptions or variations or whatever the case may be. The attitude of the Client and the Engineer toward claims is often at fault. A claim is often regarded by them as an attempt by the Contractor to make up for poor prices and a loss of profit, but as pointed out by L. Dison[15] the Contractor would have to be a genius to accurately predict the sort of claims he is likely to be paid and would also have to possess financial resources which would withstand the sometimes inordinately long periods of time that pass before the claims are processed and paid. However, it is more

likely for claims to occur on a losing contract than on a successful one. Both the Contractor and the Engineer are however sometimes guilty of what Tony Hallier[19] calls "emotive pigheadedness," the Contractor trying to build "bricks of straw" and the Engineer refusing to be open-minded.

With regard to the handling of claims in the correct manner to prevent disputes the following items advocated by H. C. Blersch[7] and the Guideline G7 [31] should be adhered to:

i) **Contractor to give notice of intention to claim as soon as possible**

This early notification is good practice because with time memories fade, the records relating to the claim are still available and the initial people are still involved. This is not always easy, however, because a claim situation does not always occur at a clearly defined point in time and is not always instantly recognized.[66]

ii Good records concerning the claim should be kept

Records of all relevant information supporting the claim will do a great deal to avoid disputes for obvious reasons.

iii Claims should be finalised and agreed to by the parties involved as soon as possible.

This will prevent any bad feelings which would result from a delay in processing the claim. Any unexplained rejection of a claim can "damage relationships significantly and make further negotiations more difficult protracted and expensive, frequently polarising the parties precipitating resort to legal advice followed by arbitration or litigation." [66]

Finalising claims as soon as possible will also enable the Contractor to establish where he stands overall financially on claims, instead of having to wait until near the end of the Contract to make claims which he might have dropped altogether.

"Claims are a fact of life in the construction industry. Having recognized this fact, all that remains is to ascertain how best to deal with them". [66]
This is the crux of the claims matter. Every effort should be made to deal with claims in a manner conducive to avoiding disputes.

2.5. Adverse Physical Conditions (Unforeseen conditions)

The factor of unforeseen site conditions is one of extremely high risk and almost always results in delays and variations.
According to Loots [23] "disputes in connection with conditions or obstructions which could not have reasonably been forseen at the time of tendering are frequent and many of these lead to arbitration or litigation."
L. Dison[15] states that unforseen site conditions are probably the most frequent cause for major disputes in Civil Engineering Contracts. This is especially so in tunnelling contracts. An example of a tunnelling contract which involved a dispute over unforseen conditions is the Explosives Engineering vs South African Railways (1975) [35] case which went to arbitration. The arbitration findings were interesting and provide pointers for avoiding disputes in this respect. They were as follows:
i) That forseeability should be considered in the context of the circumstances obtaining at the time of tendering.
ii) That the Contractor could not have been expected to carry out his own investigation in the period of about five weeks allowed by the Administration for tendering. It is almost always the case that the Contractor has insufficient time to conduct investigations that will provide any more insight into what conditions can be expected than the geologist's report would.
iii) The consulting geologist, the consulting engineers, their specialist consultant, another tenderer, a consulting mining engineer and a firm of consulting geotechnical engineers all did not forsee the adverse physical

conditions which were a set of continuous, near horizontal joints or fractures found in the tunnel. It is often the case that Employers and Consulting Engineers try to distance themselves from the reports of the experts and this is a fundamental source of dispute.

iv) That interpretation of the various clauses also led to the dispute in that there was a lack of clarity with regard to the relationship between the types of excavation in the geological report and those in the Contract document. Clarity in the General Conditions of Contract with respect to adverse physical conditions is vital if disputes are to be avoided. The phrase "reasonably foreseen by an experienced contractor" which appears in most clauses pertaining to unforeseen conditions often leads to varying interpretations which results in disputes. Abrahamson[1] defines "experienced" as being experienced in the particular class of work being done.

Another more recent case which involved unforeseen conditions was that of S.A. Comiat vs S. A. Transport Services (1983)[21] in which the initial contract value was for R27,7 million and the final claim was for R200 million. Mr. G. Fisher[18] cited bad relationships between site personnel as a major factor leading to the dispute and the Contractors were reprimanded by the judge for their attack on the Engineer's integrity. Unforeseen conditions which cause delays often have this effect on relationships and aggravate the dispute. Unforeseen conditions are undoubtedly one of the major considerations with regard to risk and avoidance of disputes. All General Conditions of Contract should have a clause which clearly defines the apportionment of risk in this regard as pointed out by J.F. Mc. George: "Any set of contract conditions which does not contain a clause similar in effect to clause 12 (G.C.C. 1982) represents a very high risk situation and should be treated with extreme caution."

2. 6. Extension of Time

Any delay, no matter what is the cause, prompts the Contractor to claim for an extension of time since his programme is normally very tight and if he does not complete the Contract in time, penalties are applied.

Previously Contractors were granted an extension of time without too much problem but in today's economic climate where "time is money" the question of time extension often results in lengthy disputes. All the persons interviewed regarded extension of time as a major source of dispute, and it is a factor in most cases going to litigation.

2. 7. Payment

Ultimately the Contractor's problem is one of payment. If the Contractor received payment timeously for contractual work done as well as for variations and claims, disputes would be kept to a minimum.[6] Payment is thus a major source of dispute.

2. 8. Conclusion

i) The most important secondary causes of dispute are the ones which have been discussed, Risk being the most important of the secondary causes.

ii) Delays, Claims, Adverse physical conditions, Extensions of time and Payment are all risk related and a consideration of risk is thus extremely important with regard to avoiding disputes.

3. Handling Risk

It has been established that a consideration of risk is paramount with regard to avoiding disputes. *Methods of handling risk with a view to reducing the* incidence of disputes will now be discussed.

3.1. Risk Identification

In order to facilitate the smooth running of contracts the risk associated with the performance of the work has to be identified in order for it to be allocated fairly amongst the parties involved. Strictly speaking risk is not a problem; the fair allocation thereof is and it can only be fairly allocated if it has been identified. The identification of risk "provides the basis from which the appropriate organizational structure, tendering procedure, type of contract and risk allocation through the contract documents can be formulated"[28] and for all these reasons it is extremely important.

Mr. H.C. Biersch[7] regards risk identification as "an essential pre-requisite for an equitable outcome" (to a contract.)

How does one identify risk? J. G. Perry and R. W. Hayes[29] believe that by identifying specific events and activities individually, the associated risks can also be identified. They go on to say that a risk event implies that there are a range of outcomes, each with a probability of occurrence. Risk identification involves predicting this range of outcomes and the probability of occurence in order to attempt to reduce the risk and allocate the remainder fairly, thus minimizing the chance of disputes.

The responsibility for identifying risks lies chiefly with the Employer, his motivation being to achieve his objectives with respect to time, cost and performance.[28] The Contractor also has to identify risks once they have been allocated contractually but he also needs to identify those risks associated

with actually executing the work so that he can prepare a realistic tender price. This identification of risks by him is very important because if unexpected events do occur for which he has not catered, he is likely to submit claims which are likely to involve lengthy disputes. The Engineer has to anticipate the uncertainties of a contract on behalf of the Employer and estimate their effect on the Contractor's cost before he can apportion the risk in such a way as to minimize the potential for disputes.

Time spent identifying risk is time well spent because it can help to reduce risk, helps in fairly allocating it and assists in reducing the incidence of disputes.

3. 2. Risk Reduction

It follows that the less risk there is in a contract the less chance there is of disputes because there are fewer uncertainties. Therefore an attempt should be made after identifying the risks and before allocating them, to reduce the risks. Risk can be reduced in the following ways :

i) Site Investigation

Many Employers believe that by saving on site investigation they are saving themselves money. This is seldom the case. Mr. L. Dison[15] clarifies this point: "Few employing authorities seem to appreciate that adequate allocation of funds at the time of design and site investigation is an investment in the eventual successful and economical completion of projects." Barnes[3] uses a tunnelling project as an example. He points out that risks associated with uncertain ground conditions are always high but could be substantially reduced by drilling more than a minimal amount of exploratory boreholes or by driving a pilot tunnel.

A thorough site investigation helps to reduce uncertainties on all projects

because most projects have unforeseen site conditions, which as already established are frequently the cause of major disputes.
Reduction of uncertainties by means of a thorough site investigation gives all the parties involved a better indication of what to expect.
The Engineer can then produce a more adequate design, a more accurate schedule of quantities, a more comprehensive set of specifications and conditions of contract which allocate risk fairly, thereby reducing disputes.

The Contractor can produce a more realistic tender thereby reducing the incidence of claims to make up profit and consequently reducing the chance of disputes.
The Employer has a better than even chance of the contract being completed within budget.
A determined effort is required to improve site investigations!

ii) Management & Planning

Risk can often be reduced by better management and planning of a project. Most disputes "are founded in a management shortcoming, whether this is a direct management shortcoming or a failure by managers to implement the contract in a thorough, objective and rational manner"[2] Barnes goes on to say that "good project managers can manage effectively in spite of a contract (a poor contract) if they are lucky".
Through good management the timely issue of information concerning all matters pertaining to the project to the Contractor would reduce the risk of delay. This information would include contract documents such as drawings, reports of site investigations etc. Good managers would advocate thorough site investigations, which reduce the risk of variations, delays, claims and disputes. Good management also involves careful preparation of contract

documents and the resolution of disputes at site level, through better communication, before they go to arbitration or litigation. Good management on behalf of the Contractor would result in realistic tenders being submitted.

A good design which would "minimize" the number of separate operations, minimize the interactions between components and minimize the diversity of components"[3] producing a lower risk construction, is also a function of good management.

Planning is a function of management too. An example of risk reduction through good planning is the technique applied to project networks.[3] Nodes from which many activities converge and diverge are high risk nodes where the risk of delay is the "aggregate of the risk of delay to each of the converging activities.

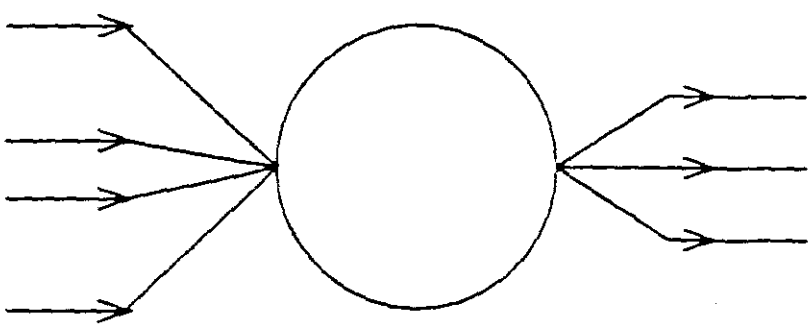


Fig. 3.1 A High Risk Node

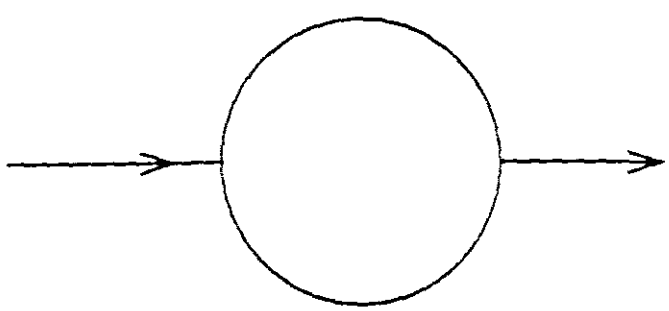


Fig. 3.2 A Low Risk Node

Through better planning the number of converging activities could be reduced thereby reducing the risk of delay to the diverging activities. In the words of Loots[23] "Possibly the most impressive and painstaking efforts to utilise the network techniques have been in claims proceedings and litigation following completion of certain projects. In fact those involved in such efforts often conclude that, had a small fraction of the same type of effort been exerted at the beginning and during the course of the project, many losses would have been avoided and litigation might have been unnecessary". The importance of management and planning in reducing risk and avoiding disputes is evident.

C) Contract Documents.

In order to reduce the risk of delays, disputes, variations, claims and extensions of time the contract documents need to conform to the following requirements.[7]

i) The most important is that they convey the employer's intent unambiguously and clearly. Dr Martin Barnes[2] believes that if the contract were clearer there would be fewer disputes. He cites ground conditions as an example, saying that if the contract said unequivocally that if the Contractor hits ground conditions worse than described in the contract documents he will be paid the extra cost, fewer disputes would arise. There would still be disputes about whether the ground conditions were indeed worse but the interpretative disputes would be eliminated.

Mr. P. Beard[5] regards varying interpretation of clauses as a major source of dispute.

ii) The next most important requirement is that the intent of the contract documents maintain an equitable balance between Employer and Contractor over the widest range of possibilities.

Clarity in the documents is required concerning the following:

1) Detailed nature, extent and required quality of the works .
   Drawings which are informative, accurate and realistic quantities and explicit specifications as well as compatibility of all documents.
2) Information on cost-affecting factors such as underground conditions.
3) Allocation of risk between Employer and Contractor.
4) Programme requirements or restrictions with possible cost implications.
5) Restrictions on normal construction procedures again with cost implications.
6) Basis for interim payments.

If these requirements are adhered to, the risk involved would be greatly reduced.

3. 3. Risk Allocation

Once the project risks have been identified and an attempt has been made at reducing them, the risks can be allocated fairly amongst the parties involved. The principles employed while allocating risk are extremely important with regard to reducing the number of disputes. According to Barnes[3] "a satisfactory principle of risk allocation would lead to a more direct realization of objectives for clients and contractors and would dramatically lessen the conflicts that so often frustrate effective project management."

A study of claims and disputes indicates that disputes reaching mediation or arbitration are more often than not "generated by differences arising from inprecisely defined risk-apportionment."[7] Blersch[7] lists as the most important element in the role of the Engineer the preparation of Contracts, and the measure of his performance of this function is their clarity with regard to risk allocation.

By allocating risk fairly the chance of disputes arising over claims for compensation over and above benchmark values covering the contractual risks, as well as the claims themselves are greatly reduced.

3. 3. 1. Principles of risk allocation

The following are the fundamental principles of risk allocation as advocated by inter alia Blersch, Barnes and Cockroft.

a) If the risks are outside the contractor's control they should be allocated to the client. .

Examples of risks which are outside the Contractor's control are :

i) The contractor's input cost variation generated by local inflation or foreign exchange fluctuations.[7]

Clients who allocate most of the inflation risk to the Contractor often get artificially low tender prices but have problems getting the work completed within budget and to a satisfactory standard.[3]

ii) Underground condition risk: allocation of this risk to the contractor "nearly doubles the total risk and may lead to the threshold of tolerable risk being crossed"[3]

Clarity on benchmark assumptions are essential and the Employer should put all the results of the geotechnical investigation at the Contractor's disposal, including the Engineer's interpretation thereof. The Employer should then remain committed to this report.[7] Very often the Employer tries to distance himself from the geotechnical findings if they prove to be inaccurate, with the potential for endless conflict.

iii) Flood or stormwater damage (contingent costs only, because this is risk insurable)

iv) Deviation from estimated quantities - this includes effects on the

Contractor's programme and on the cost per unit of measured work of deviations exceeding stipulated reasonable margins.[7]

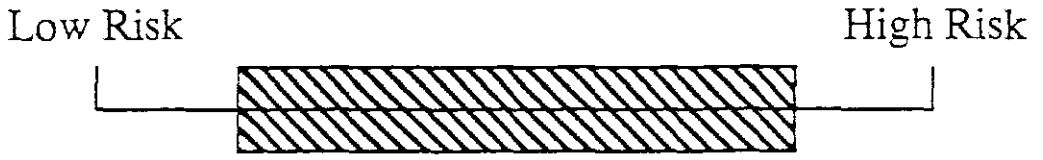
b) Contractor should bear risks over which he has control or which he should be able to evaluate reasonably closely at the time of tender.

Allocation of risk to the Contractor provides him incentive for containing the costs and minimizing the impact of the risks. However, there are sound arguments for allocating as little as possible risk to the Contractor. "Where the total amount of risk carried by the Contractor is continuously excessive, success for a contracting company comes to depend on its ability to rescue an unprofitable job by the pursuit of additional payment from the Client."[3] Consequently, to avoid such claims and to stimulate the Contractor's efforts to control the uncertainties, it is good policy for any Client to use Conditions of Contract that do not allocate too much risk to the Contractor. The result will be that the work will be carried out efficiently and economically. "It is only by limiting risk that efficient Contractors are rewarded by getting awarded contracts".[3]

An important consideration when allocating risks are the conflicting attitudes to it. Erikson[3] has deduced that Contractors are risk-averse and Porter[3] that Clients are risk-neutral. Barnes[3] concludes from these deductions that the best policy for lowest cost construction is for most of the risk to be carried by the client. He saves money by not having to pay the premium that the risk-averse Contractor would wish to charge. This is further argument in favour of keeping the total risk allocated to the Contractor low.

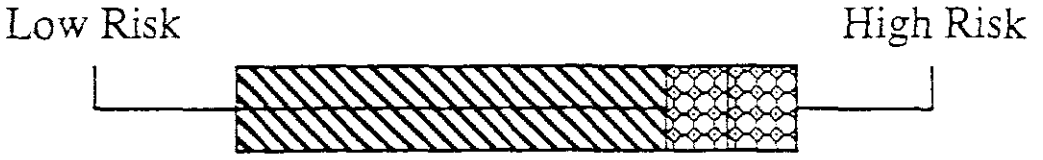
T. N. Cockroft[13] illustrates the difference in attitudes of the Engineer (on behalf of the Client) and the Contractor by means of the following diagrams.

Fig. 3.3 The Contractors Attitude to Risk



The Contractor tends to price in the shaded region, midway between the point of low risk and the point of the high risk.

Fig. 3.4 The Consultants Attitude to Risk



The Engineer will normally consider a claim in the shaded area but would disallow a claim in the dotted area.

It should be noted at this point, that certain risks e.g. Flood damage and Acts of God are insurable and do not have to be apportioned between the Employer and the Contractor.

c) The remaining risks outside the control of both should then be appropriately allocated.

The emphasis here should be on fair allocation.

T.N. Cockroft[13] believes that Time, Method and Quantity related measurement where rates are split into fixed, time related or quantity related items is a good way of allocating risk. This is a concept advocated by Dr. Barnes.[4]

It cannot be over emphasized how important risk allocation is with regard to the eventual successful and economical completion of a project with the minimal amount of disputes.

3. 4. Conclusion

i) With regard to handling risk, risk should first be identified.

ii) Once the risks have been identified an attempt should be made to reduce them by means of thorough site investigations, good management and planning and clear unambiguous Conditions of Contract.

iii) After risk identification and reduction, risk should be allocated contractually in a fair way by adhering to the principles discussed.

iv) Intelligent treatment of risk, i.e. adherence to the proven principles of handling risk, will do a great deal towards minimizing disputes.

4. Handling Disputes.

There will always be a certain amount of disputes in Civil Engineering. Every effort should be made to plan to avoid disputes and not to win them.[24] Every effort should also be made to deal with disputes at site level before they go to mediation, arbitration or litigation.

4. 1. Mediation, Arbitration and Litigation

If for some reason disputes cannot be resolved at site level, mediation is a far better alternative than arbitration or litigation if only because mediation is a far less costly process. Other advantages of mediation are as follows :[31]

i) It is essentially an informal method of resolving disputes.

ii) The mediator has a duty to get the parties to agree.

iii) The mediator is a man of eminent status whose opinion is respected even by those who do not agree with it.

iv) No legal representation is necessary.

v) It encourages an awareness of the other man's point of view, and in this way lays the foundations necessary for a mutually acceptable agreement.

The results of a questionnaire on the following page on arbitration and mediation cases provides some interesting pointers. The results were tabulated in the form of a report. It was intended to compile information on how often mediation and arbitration had been successful in resolving a dispute, and was sent to members on the Institutions' Panel of Mediators. Of the members, 72,9% responded to the questionnaire. The results of the questionnaire were, in tabulated form, as follows:

Year	Number of mediation cases undertaken	Percentage of cases successful
1982	20	90%
1983	24	87,5%
1984	29	70%
1985	37	70%
1986	45	78%

Of the abovementioned mediation cases the following number went to arbitration:

1982 - 1
1983 - 3
1984 - 9
1985 - 11
1986 - 8

Of the abovementioned arbitration cases only 3 went to litigation. The respondents commented that general arbitrations during the period would probably have been avoided if the contracts had contained Mediation Clauses. From this report it can be concluded that mediation is a highly successful method of resolving disputes and that a mediation clause is very necessary in all General Conditions of Contract. Any general conditions which don't have a mediation clause should be treated with caution.

At this point it is considered expedient to make a proposal that could help to reduce disputes. That is that at least the pertinent facts which led to the disputes arising in mediation and arbitration cases should be made avaliable

for analysis in order to prevent the same mistakes being made in the future. The parties involved could be kept anonymous and the lessons learnt would be fruitful.

4. 2. Conclusion.

i) Every attempt should be made to resolve disputes at site level.

ii) If for some reason disputes cannot be resolved at site level, mediation is a far better alternative than arbitration or litigation.

iii) Relevant facts pertaining to causes of disputes leading to mediation or arbitration should be made available to prevent similar mistakes being made.

iv) Every Contract Document should contain a Mediation Clause.

Section B : A Critical Analysis of Clauses Relating To The Major Causes of Dispute.

It was established in Section A that the major secondary causes of disputes were the following: Risk, Variations and Alterations, Delays, Claims, Adverse Physical Conditions, Extension of Time and Payment.

A critical analysis will now be conducted on clauses of various in-house documents specifically relating to these major causes of dispute. A comparison will then be made between the various relevant clauses of the respective General Conditions of Contract.

Generally speaking, for any one of these clauses to be effective they should ideally conform to the following requirements:

a) That they convey the employer's intent unambiguously and clearly.

b) That for the above mentioned clarity to be realised and maintained, too many cross references should be avoided, short and simple sentences should be used, and sentences should be complete.

c) That risk be allocated fairly and to the party most capable of dealing with the risk and most capable of doing something about minimizing the effect of the risk.

d) That an equitable balance between the Employer and Contractor be maintained over the widest range of possibilities.

e) That obligations of all parties are clearly identified.

f) That the consequences of poor performance on the part of all parties is clearly identified.

g) That all requirements are so far as possible fair, reasonable and practical.

Should these requirements be met, the chances of a dispute arising are minimal. Comments will be made in this regard.

Some of the in-house documents have recently been revised and comment will be made on the effect of these revisions. Comments will also be made on the effectiveness of the clauses, or whether they are likely to be effective in creating an equitable agreement between the parties involved.

The documents which will be compared are as follows: General Conditions of Contract 1982, General Conditions of Contract 1990, C. S. R. A. 1986, I. C. E. (Fifth edition) and ESKOM. 1990 * (hereafter called Eskom)

* It is assumed that the reader is familiar with these documents or has ready access to them.

Chapter 5 : Risk

Risk as previously mentioned is an extremely important consideration with regard to avoiding disputes. All the secondary causes of disputes discussed in the previous section are risk related and will be discussed under the relevant clauses in later chapters. Because of the importance of Risk, however, it is considered necessary to discuss and compare clauses relating to the Care of the Works, Special Risks and Excepted Risks.

It should be borne in mind that insurance is also important with regard to risk but since insurance is not one of the major causes of disputes it will not be considered in this document.

5.1 Care of Works and Excepted Risks

This is handled by Clause 20 of G C C '82, Clause 20 (1) being Care of Works and Clause 20 (2) being Excepted Risks.

The Care of Works clause is reasonably clear in its intent. Shorter sentences could be used, however.

There is also no clear definition of transfer of responsibility on completion of part of the works.

The intent of the corresponding G C C '90 (clause 35 (1)) is similar, only it has been better structured by using shorter sentences and a more effective layout which makes the clause easier to interpret. The transfer of responsibility from Contractor to Employer has now been clearly defined and this is an important improvement, because it is in fact a transfer of risk.

The C. S. R. A. Care of Works clause (Clause 20 (1)) is identical in intent to that of G C C '82 and has the same shortcomings.

The ESKOM clause is handled by sub-clauses 7.1 and 7.2. The intent of this clause is very similar to that of G C C '90. There is also a clear definition of transfer of responsibility.

The I C E Care of Works clauses are Sub-Clauses 20 (1) and 20 (2). There is a definition of transfer of responsibility, the transfer occuring 14 days after the issue of a Certificate of Completion as opposed to immediately after the issue as is the case with ESKOM and the G C C '90 documents.

The Excepted Risk clause (Clause 35 (2)) of G C C '90 is again similar to that of G C C '82. There are, however, some notable additions. The most important is that causes arising as a result of specifications and instructions of the Employer as well as the design, specification and instructions of the Employer's agents have been included as excepted risks. G C C '82 only includes a cause due to the Engineer's design of the Works. The G C C '90 clause presents a more equitable arrangement since it is hardly fair to expect the Contractor to carry responsibility for the specification and instructions of the Employer or his agents. Other additions are Sub-Clauses 35 (2) (f), 35 (2) (k) and 35 (2) l.

The C. S. R. A. excepted risks are identical to those of G C C '82, again with the same shortcomings. The ESKOM excepted risks are also very similar to those of G C C '82 with no mention of causes arising as a result of specifications and instructions of the Employer and his agents.

The I. C. E. excepted risks are lumped together in one sentence which is not very effective. Provision is however made for causes due to the Employer's agents or servants.

5. 2. Special Risks

Special Risks in G C C '82, G C C '90 C. S. R. A, ESKOM and I. C. E. are handled by clauses 68, 57, 68, 37 and 65 respectively.

The intent of all these clauses are similar with the important differences being as follows:

a) C. S. R. A. is the only document that makes provision for both the

Employer and the Contractor to terminate the Contract in the event of war. All the other documents make it the exclusive right of the Employer.

b) The I.C.E. document contains a number of provisions which are absent in the other documents. These provisions clarify the Contractor's right to compensation for damages resulting from war. Since cost is one of the primary causes of dispute this is a good point in its favour. All the other documents do mention compensation, but the position in this regard is not clarified to the same extent.

5. 3. Conclusions

a) The G C C '90 and I. C. E. Care of Works clauses are likely to be more effective than the corresponding clauses of the other documents because they both contain a clear definition of transfer of responsibility from the Contractor to the Employer. In this respect the G C C '90 clause represents a welcome improvement on the G C C '82 and C. S. R. A. clauses and is more closely allied to the I. C. E. clause.

b) G C C '90 and I. C. E. excepted risk clauses are again most likely to be more effective since they include causes due to instructions and specifications of the Employer and his agents or servants.

c) The I. C. E. Special Risks Clause has the most clarity with regard to the Contractor's right to compensation in a wartime situation and the C. S. R. A. Special Risks clause is the only one that allows the Contractor the right to terminate the contract in a wartime situation.

Chapter 6 : Variations and Alterations.

Variations and Alterations as previously mentioned are very often the cause of disputes and have been the principal cause of dispute in the following cases:

a) Alfred Mc Alpine and Son vs Transvaal Provincial Administration. (1971-1978)

b) W.J.M. vs Minister of Public Works (1980)

c) Clifford Harris vs Administrator General of South West Africa (1986)

d) Grinaker vs Transvaal Provincial Administration (1981)

Due to the relative importance of Variations and Alterations, clauses of the respective documents will be examined extensively under separate headings.

6.1. Variations and Alterations - General

6.11. General Conditions of Contract 1982

Clause 51 (1) is the variations clause in terms of which the Engineer has the power to make any variations in the form, quality or quantity of work.

Clause 51 (2) ensures that all variations are to be ordered by the Engineer in writing.

Clause 52 (1) deals with valuation of variations. It should be noted at this point, that as previously mentioned, variations themselves aren't normally a problem. It is during the assessment of the variations that disputes arise. For this reason this clause is considered to be most important of the variations clauses.

In terms of this clause the Engineer decides what amount should be added or deducted from the Contract value and he in agreement with the Contractor determines new prices if the current rates are inapplicable.

Clause 52(2) is repetitive of the previous clause but it also obligates the Contractor to state his intention to claim extra payment in writing, so too the

Engineer his intention to vary a rate or price.

If the Contractor disagrees with any rate or price set by the Engineer, he has a remedy in terms of Clause 69. Note that the Employer has no power to order variations personally and has no say in the valuation of variations.
The variations also have to be within the scope of the work. It is interesting to observe that in common law variations can only take place with the mutual consent of the parties involved, but this clause 69 takes precedence. This is possibly another reason why variations create disputes.

6.1. 2. General Conditions of Contract 1990

Clause 39 (1) is the variations clause of G C C '90. In terms of this clause the Engineer has a power in addition to the corresponding clause of G C C '82. This is that he may now issue a variation order to change the specified or approved sequence or method of construction. This new power of the Engineer is unlikely to please many Contractors. It is normally an unwritten agreement that it is the Contractor's right to decide on a method of construction, as long as the specifications are adhered to. Consequently there is potential for dispute.
Clause 39 (2) requires for the variation orders to be in writing and the time limits mentioned have been changed from 10 days (G C C '82) to 14 days.
As contained in Clause 51 (2) of G C C '82, Clause 39 (3) states that an increase or decrease in the quantity of work scheduled does not constitute a variation. This decree often forms the subject matter of dispute when there is a relatively large increase in the quantity of work scheduled as was the case in Richtown Construction Company (Pty) Ltd vs Witbank Town Council and another (July 1982) [53 & 37] This will be discussed further at a later stage.

Clause 40 (1) deals with valuation of variations. Here there has been a definite improvement in clarity when compared to the corresponding clause of G C C '82. The work is now valued according to certain definite principles. Clause 40(2) allows for the Engineer or Contractor to require a change in rate or price. Here the Contractor may have remedy for compensation as a result of a variation order requiring a change in the method of construction.
The notice of this change has to be in writing in accordance with Clause 40 (3).

6.1.3. C.S.R.A.

The C. S. R. A. variation clause (Clause 51(1)) is identical to the corresponding G C C '82 clause save in one respect. That is that the Engineer has the power to order the Contractor, and the Contractor is bound to do additional work for which the contract does not make provision; only it may not be treated as a variation and has to be treated as a supplementary agreement, in accordance with clause 51 (3). This is somewhat contradictory, and it is not clear whether the Contractor has to execute this additional work when ordered to do so, even if the supplementary agreement has not been finalised and agreed to by both parties.
As was the case with G C C '82, orders for variations have to be in writing in terms of Clause 51 (2)
In terms of clause 52 (1) the Engineer is to decide the amount to be added or deducted from the contract value and if the contract rates are considered inapplicable by him he shall decide by which method the addition or deduction shall be determined.
In Clause 52 (2) the previous clause is contradicted because it appears that the above mentioned decisions are not the Engineer's alone, since rates determined by him have to be approved by the Employer. In this respect

the C. S. R. A. document is poor, as this is not the only instance when there is an erosion of the traditional powers of the Engineer. At this point it is considered expedient to elaborate on this particular subject:

In terms of Clause 2 (3), the Employer has the right to amend any certificate, direction, decision or valuation of the Engineer; which effectively renders the Engineer powerless. Recipe, surely for lengthy disputes. Throughout the Contract Conditions, the Engineer has to obtain the Employer's approval which can be noted at a later stage when further clauses are discussed. Since Clause 52 (2) governs Clause 52 (1), the Employer has the right to decide on valuation of variations and can overrule any decision the Engineer makes in this regard. The potential for dispute is obvious.

6.1. 4. ESKOM

It should be noted that the role of the Engineer is filled by the Project Manager in the case of ESKOM General Conditions of Contract.

Clause 23.1 is the variations clause. It is remarkably similar to the corresponding clause of G C C '82 and differs only in the following respects:

a) If the Project Manager omits any work it may not be carried out by the Employer or any other Contractor without approval in writing by the Contractor. This is a worthwhile requirement.

b) In terms of Sub-clause 23.1 f the Project Manager has the power to order a change in the specified or approved method of construction as per G C C '90. This is not a good situation for reasons discussed previously.

Clause 23.2 requires the variation order to be in writing.

Valuations of variations (Clause 23.4) is done in a similar fashion to G C C '90. However the Project Manager in terms of Clause 23.5 has to obtain the Employer's approval for variations as per C. S. R. A. If the Contractor fails to agree with the Project Manager (or Employer's) decision he has the right to

determination in terms of Clause 35 (the disputes clause) in accordance with Clause 34 (the claims clause.)

6.1.5 I. C. E.

I. C. E. is very closely allied to G C C '90 conditions in terms of variations, and the variations clause (Clause 51) and the valuation of variations clause (Clause 52) are identical in intent.

6. 2. Variations exceeding a certain percentage.

This is clearly a clause which is often the centre of disputes. It was the central clause in the case Melmoth Town Board vs Marcus Mostert (Pty) Ltd. [40 & 60] General Conditions of Contract 1972 was used in this case and it's "variations exceeding 15 per cent" clause was identical to that of the General Conditions of Contract 1982.

According to Loots [23] "the court's decision involved in the final analysis, an interpretation of clause 54, and in particular the powers of the engineer under clause 54" It follows, therefore, that had the powers of the Engineer in terms of this clause been more clearly defined, the dispute might not have taken place.

The corresponding clause of G C C '90 (Clause 53) has not done much to clarify the Engineer's powers in this regard. There are also additional exclusions from the Contract price and Tender Sum. These are Provisional Sums, Prime Cost items and Dayworks. With regard to Provisional Sums there appears to be a contradiction; this is that in terms of Clause 48 (1) of G C C '90 if the work to which the Provisional Sum relates has been ordered by the Engineer and is carried out by the Contractor, it shall be treated as a variation, which in terms of Sub-Clause 53 (b) would qualify its inclusion in the Contract Price. However this is contradicted by Sub-Clause 53 (c) (ii).

Why, also, are Dayworks and Contingencies excluded, when if executed they will have a definite effect on the Contractor's overheads? The majority of Contractors interviewed expressed dissatisfaction in this regard. Clause 54 (1) of C. S. R. A. is identical in intent to Clause 54 of G C C '82, only in the case of C. S. R. A, Variations have to exceed 20 percent as opposed to 15. In terms of Clause 54 (2) an increase or reduction in the quantity of work scheduled is also taken into account as is the case with G C C '90. G C C '82 is not clear in this regard.

The relevant ESKOM clause (Clause 26.5) also takes into account adjustment upon measurement of quantities and it also appears to exclude Provisional Sums and Prime Cost Items. Dayworks is excluded.

The I. C. E. General Conditions of Contract do not appear to make provision for variations exceeding a certain percentage.

6. 3. Conclusions.

a) The G C C '90, ESKOM and I. C .E documents allow the Engineer (or Project Manager in the case of ESKOM) to order a variation order to change the approved sequence or method of construction. This power is likely to result in dispute.

b) Much has been done in the G C C '90 document to clarify the valuation of variations and the G C C '90 clause is a definite improvement on the G C C '82 clause.

c) Both C. S. R. A. and the ESKOM documents require the Employer's appproval with respect to valuation of variations. This undermines the authority of the Engineer and results in a situation that is not equitable.

C. S. R. A. is a poor document in this respect and Clause 2 of C. S. R. A. renders the Engineer powerless and creates a situation in which it is impossible for the Engineer to be impartial.

Chapter 7 : Claims and Adverse Physical Conditions

As previously stated adverse physical conditions are probably the most frequent cause of disputes in Civil Engineering contracts. Claims for compensation due to adverse physical conditions are frequent and it is therefore considered expedient to deal with Claims and Adverse Physical Conditions together.

7.1. General Conditions of Contract 1982

7.1.1. Adverse Physical Conditions

In terms of Clause 12(1) the Contractor has to satisfy himself as to the sufficiency of his tender.

In terms of Clause 12 (2) if adverse physical conditions and obstructions are encountered which could not have been reasonably foreseen by an experienced Contractor, the Contractor has to give notice of intention to claim in writing, stating the physical conditions and obstructions encountered, the additional work he proposes to do and the extent of the anticipated delay.

It is interesting to note that these controversial words "reasonably foreseen by an experienced Contractor" have been retained in the relevant G C C '90 clause and are present in all the other documents. Surely past evidence would indicate that this phrase is highly ineffective and results in a number of varying interpretations which give rise to disputes? According to Loots [23] "these words give rise to the most frequent disputes of fact which come before engineering arbitrators".

In terms of Clause 12 (3) all circumstances relating to claims shall be investigated and recorded and agreed as and when they occur. Records shall be provided from day to day by the Contractor to the Engineer. Investigation of claims when they occur and the keeping of records is good

practice for reasons mentioned previously. However it is difficult to decide when the claim situation actually did arise because it does not always occur at a clearly defined point in time. In terms of Clause 12 (4) the Engineer and the Contractor have to agree or disagree on the correctness of the information recorded. The Contractor forfeits his right to rely on facts which should have been recorded and have not been, this in terms of Clause 12 (5). If the Contractor requires, any claims made in terms of Clause 12 (2) can be referred to a mediator in terms of Clause 69 (2). The Contractor can give further notice of more extensive adverse physical conditions encountered in terms of Clause 12 (7).

7.1.2. Claims

The G C C 1982 claims clause is concise and to the point and for this reason is relatively effective. In terms of this clause (Clause 53) the Contractor has to supply the Engineer an account giving detailed particulars of claims for any additional expenses. He has to also comply with the requirement to notify the Engineer at the earliest opportunity of his intention to claim.

7.2. General Conditions of Contract 1990

7.2.1. Adverse Physical Conditions

Clauses pertaining to adverse physical conditions (Clause 50 (1)) and further notices (Clause 50 (2)) are identical in intent to the corresponding clauses of G C C '82.

In terms of Clause 50 (3) the Engineer may order a suspension or variation. This is an addition. All claims have been transferred to a general clause applicable to all claims (Clause 51), as are records of facts and circumstances.

7.2.2. Claims.

Clause 51 sets out the procedure with regard to claims and record of facts and circumstances. This clause is likely to be very controversial and conducive to a high incidence of dispute.

The majority of Contractors interviewed were unhappy with this clause and felt that it would create a great deal of bad feeling between the parties involved.

This clause is poor for the following reasons:

a) Previously in accordance with the conditions of G C C '82 all matters relating to claims were dealt with in terms of variations under normal measurement. In the case of G C C '90 all matters pertaining to claims have to be dealt with in accordance with Clause 51. Effectively, no fewer than eleven clauses pertaining to claims are governed by Clause 51. This will result in a maze of cross-reference which can only cause confusion.

b) The Contractor has to give notice of conditions encountered whether he intends to claim or not. This is an unfair requirement.

c) The Contractor has to comply to time limits if he wishes to claim, which are unreasonable. In terms of sub-clause 51 (2) the time limit of 28 days commences to run from the date when the Contractor becomes reasonably aware of the implications of the facts or circumstances concerned. The Comtractor may not even be aware of the facts and circumstances, let alone the implications of them.

d) The rule that none of the parties are entitled to give or lead evidence on any fact or circumstance not recorded (Sub-clause 51 (3) (f)) is too absolute. There should be more machinery for leave being given.

e) In terms of Clause 51 (4) the Contractor shall have no right to claim unless he has complied with the provisions. This is very harsh because there may be good reasons for the Contractor's failure.

f) Sub-clause 51 (6) gives the Engineer the right to neglect his duty to make a decision on the claims issue.

The stated objective of this clause was to "discipline the Contractor and Engineer into investigating matters promptly and to record their respective version of the facts leaving questions of law and interpretation as the major issues in subsequent proceedings." [11] The relevant clauses of G C C '82 stand just as much chance of achieving these objectives without resorting to verbal overkill and unrealistic notice requirements.

7.3. C. S. R. A.

7.3.1. Adverse Physical Conditions

Clause 12 (1) (Sufficiency of tender) is almost identical in intent to the corresponding clause of G C C '82 but it also gives a breakdown on what the rates and prices of the schedule are deemed to include. In terms of Clause 12 (3) the Engineer will decide if the adverse physical conditions could have been foreseen by an experienced Contractor. If he decides they could not have been foreseen, the Contractor is entitled to additional payment in accordance with Clause 52 (variations clause). The Engineer can also order a suspension or variation in terms of Clause 12 (4).

If the Contractor wishes to claim, the provisions of Clause 53 have to be complied with.

7.3.2. Claims

The claims procedure is identical to that of G C C '90 with the same shortcomings. C. S. R. A. also has similar requirements with respect to records of facts and circumstances. However in terms of Sub-clause 53 (5) (c) records have to be made available to the Employer, so in addition to all the shortcomings previously discussed, the Engineer will probably be

influenced by the Employer when making decisions with regard to claims.

7. 4. ESKOM

7.4.1. Adverse Physical Conditions.

Clause 22.1 of ESKOM is identical in effect to the corresponding clause of G C C '90 except it is limited to adverse physical conditions encountered while executing earthworks below ground surfaces. This represents unfair allocation of risk to the Contractor as adverse physical conditions are not always encountered below ground level.

Clause 22.2 requires the Contractor to effect work necessary for safety and protection of work, people or property prior to giving notice required in accordance with Clause 22.1. Notice is to be given as soon as is practicable after executing the work.

The Project Manager has to make the decision in accordance with Clause 22.3 as to whether the conditions could have been foreseen. Clause 22.6 requires that all claims be made in accordance with Clause 34.

7.4.2. Claims

Once again the ESKOM claims procedure is almost identical to that of G C C '90 with identical shortcomings. So too records of facts and circumstances. Also in terms of Clause 34.9 the Project Manager may neglect his duty to decide on a claim as per G C C '90 and C. S. R. A.

7.5. I. C. E.

7.5.1. Adverse Physical Conditions

The procedure followed with respect to adverse physical conditions is as

follows:

a) After encountering adverse physical conditions which he considers could not reasonably have been foreseen, the Contractor gives notice under Clause 52 (4) (Claims clause) as soon as reasonably possible after happening of events giving rise to the claim.

b) The Contractor shall then give details of anticipated effects and the measures he is taking. It is the Contractor who must decide (subject to the Engineer's approval) what measures are necessary.

c) The Engineer may require an estimate of the cost. This is more on a line with G C C '82.

7.5.2. Claims.

The procedure for claims in terms of Clause 52 (4) is as follows:

a) If the Contractor intends to claim a higher rate than that notified by the Engineer in the variations clause (Clause 52 (2)) he shall submit this intention in writing within 28 days of such a notification.

b) The Contractor to give notice of intention to claim as soon as possible after events giving rise to the claim. Records to be kept to support the claim.

c) The Engineer may instruct the Contractor to keep further records and the Contractor to allow the Engineer to inspect such records.

d) The Contractor to provide the Engineer with detailed particulars of amount claimed to date.

e) If the Contractor fails to comply with the above provisions then he is only entitled to payment in respect of claims which the Engineer has been able to substantiate.

This is more in line with G C C '82.

7. 6. Conclusions

a) Clauses relating to adverse physical conditions are very similar in all the documents. The ambiguous phrase "could have been reasonably foreseen by an experienced Contractor" is present throughout. To avoid disputes in this regard the clause should specify that if the Contractor encounters conditions worse than described in the documents he is entitled to claim for extra payment.

b) The relevant clause of the ESKOM document places unnecessary risk on the Contractor by specifying earthworks below ground surfaces as the only situation where the Contractor can claim adverse physical conditions.

c) Records of facts and circumstances relating to claims and procedure regarding claims (including adverse physical conditions), in the case of G C C '90, C. S. R. A. and ESKOM are dealt with by general claims clauses which are entirely unreasonable in their requirements and are conducive to disputes.

d) In the case of C. S. R. A. it is required that records relating to claims be made available to the Employer. The Engineer's decision with regard to claims cannot therefore be impartial.

e) The G C C '90 and ESKOM documents allow the Engineer and Project Manager to neglect their duties with regard to deciding on claims issues.

f) Of all the documents the Adverse physical conditions and claims clauses of G C C '82 and I. C. E. documents are most likely to be effective although they also have shortcomings which can be improved on, such as the phrase "could have been reasonably foreseen by an experienced contractor."

Chapter 8 : Delays

As previously discussed the major causes of delay are as follows:

i) Access to site

ii) Provision of drawings

iii) Suspension of work

iv) Variations

v) Underground Conditions

vi) Weather Conditions

Clauses relating to the above will be discussed. Variations and Adverse Physical (underground) Conditions have already been dealt with.

8.1. General Conditions of Contract 1982.

Clause 7 (1) requires that the Contractor give reasonable notice in writing to the Engineer if further drawings or specifications are required. This notice is vitally important if the Contractor is to claim for delay because it qualifies the time in which the Engineer has to supply the necessary documents. It should be noted that a programme submitted could constitute a written notice [23].

In terms of Clause 40 (1), if the activities of the Employer or Engineer upset the Contractor's programme, the Engineer may have a duty to suspend the works and the Contractor becomes entitled to costs for delay.

Suspension is at the contractor's expense if the suspension is

a) necessary for the proper execution of work or by reasons of weather conditions or by some fault of the contractor.

It will be remembered that when discussing good principles of risk allocation, flood or stormwater damage was listed as an example of a risk which is outside the Contractor's control and which, if not insurable should be allocated to the Client. The "weather conditions" above could be deemed

to include floods or stormwater damage. Clauses should be more specific in this regard as most of the clauses which mention weather conditions place the risk on the Contractor. This is an unfair allocation if it is uninsurable.

b) otherwise provided for in the Contract.

c) necessary for the safety of the works.

In terms of this clause the Contractor has to give notice of intention to claim within 14 days of the Engineer's order.

Clause 40 (2) states that if the Works is suspended for more than 90 days, and the Engineer does not grant the Contractor's written request to proceed within 28 days, the Contractor may treat the suspension as an omission or a breach of Contract by the Employer.

Delays can of course be caused by the Contractor as well and Clause 41 requires that the Contractor commences work within 30 days of notification of award of the job.

In accordance with Clause 42, if the Contractor suffers delay as a result of the Employer's failure to fulfil his obligation to give the Contractor possession of site, the Engineer has to grant an extension of time, and has to certify an amount he considers fair to cover the Contractor's expense. It is interesting to note that the Contractor need not submit a claim in this case. This is a good clause because it is unfair to expect the Contractor to suffer because of delays caused by the Employer. This clause may also be used by the Contractor where delays are caused due to late issue of drawings or instructions. It should be noted that the "expense" mentioned in this clause and elsewhere does not include overheads. This is often a bone of contention.

In terms of Clause 42 (3) the Employer is obliged to provide the Contractor right of access to the site. If the Contractor suffers delay in this respect he could be entitled to compensation in terms of Clause 42 (1).

8. 2. General Conditions of Contract 1990

As per G C C '82 the Contractor has to provide written notice in accordance with Clause 16 (6) if he requires further drawings, specifications or instructions.

Clause 16 (8) states that drawings specifications and instructions have to be provided within reasonable times, however, the Contractor has to claim in accordance with the dreaded Clause 51 if he suffers any delay in terms of Clause 16 (10). Once again the Contractor has to conform to all the tedious requirements of Clause 41.

Any delays suffered by the Contractor due to suspension of work (Clause 42 (1)) also have to be claimed in terms of Clause 51. The wording and intent of this clause (42 (1)) is otherwise very similar to the corresponding clause of G C C '82.

Clause 42 (2) (Suspension of work lasting more than 84 days) is again very similar in intent to the corresponding clause of G C C '82.

Clause 44 states that if the Contractor suffers a delay attributable to the Employer he has to claim in accordance with Clause 51. This represents a big change from the corresponding G C C '82 clause where the Engineer is obligated to grant extension of time and payments due to the Contractor. This is also the case with regard to access to and possession of site. (Clause 13 (1)) i.e. the Contractor again has to claim in accordance with Clause 51.

In terms of Clause 12 the Contractor has to commence work within the number of days stated in the appendix and not later than 28 days after receiving the letter of acceptance.

8. 3. C. S. R. A.

C. S. R. A. has the same requirements as G C C '82 with respect to custody of drawings.

If the Contractor wants to claim for delay due to suspension of work (Clause 40) he has to comply with the requirements of Clause 53. So too for delays attributable to the Employer. (Clause 42) Apart from the fact that the claims procedure of Clause 53 is unreasonable, by linking Clause 53 to Clause 40 and Clause 42, the Employer is allowed to influence the Engineer on deciding on delay related claims. Once again the independence of the Engineer is undermined.

Clause 41 (commencement of work) is identical in intent to Clause 41 of G C C '82.

No provision is made for suspension lasting more than 90 days.

8. 4. ESKOM

As per G C C '82 the Contractor has to give the Project Manager adequate notice in writing if any additional drawings, specifications or instructions are required (Clause 11.2) In terms of Clause 11.3 the Project Manager has to supply drawings within reasonable times, taking into account the requirements of the programme, and in terms of Clause 12.1 the Employer is required to give the Contractor possession of the site to enable him to proceed in accordance with the programme. However if the Contractor suffers delays with respect to the above, he has to claim in accordance with Clause 34, in terms of which the Project Manager is allowed to neglect his duty to decide on a claim. Recipe again, for disputes. In terms of Clause 21.1 the Project Manager may suspend work for any reason which he considers necessary. Once again the Contractor has to claim in accordance with Clause 34 to be granted extension of time and to be paid the extra cost.

If the suspension lasts more than 90 days the same procedure is followed as with G C C '82.

8.5. I. C. E

In terms of Clause 6, documents have to be supplied on acceptance of the tender documents. This is a good requirement as it ensures that the Contractor has the documents at an early stage which is, or should be, his right. None of the other Conditions of Contract insist on this early provision. However the Contractor only has a remedy under Clause 7 (3) for late drawings and instructions if he has requested them previously.

In Clause 13 (3) the phrase "not reasonably foreseen by an experienced Contractor" appears once again. This clause deals with delays caused by instructions or directions which disrupt arrangements or methods of construction. According to Abrahamson [1] this clause "is more conducive to chaos than to good order in contract administration and management." In terms of Clause 14 (6) the Contractor has a remedy for delay due to proposed methods of construction or provision of design criteria.

Clause 27 (6) provides for delays due to variations and Clause 31 (2) for delay due to providing facilities for other Contractors. The latter clause is unique to the I. C. E document.

The suspension of work clause (Clause 40 (1)) lacks clarity as to whether the Engineer is entitled to act only if he considers a suspension necessary for engineering reasons or simply for the convenience of the Employer. [1] The same can be said of all the suspension of works clauses of all the respective documents as they are very similar in effect. Suspension merely for the Employer's convenience would without doubt result in dispute. Clause 40 (2) makes provision for suspensions lasting more than 3 months.

8. 6. Conclusions

a) If one has to consider the real difference in the way the respective documents deal with delays, it is with respect to how the Contractor has to

claim for these delays, because if the Contractor is adequately compensated for delays suffered there should be minimal disputes. In the case of C. S. R. A., G C C '90 and ESKOM all claims concerning delays have to be made in accordance with a general claims clause which as discussed previously involve unfair and unreasonable requirements. In this respect the G C C '82 clause 42 is probably the only clause which is really fair, since the Engineer is obligated to grant extension of time and extra payment if the cause of the delay is due to the Employer, as would be the case in a common law contract. The Contractor does not need to claim, let alone comply with an unreasonable claims procedure.

b) Since delays in the G C C '90 document and the ESKOM document are linked to the general claims clauses, the Engineer and Project Manager are allowed to neglect their duty to decide on claims related to delays (See conclusions, Chapter 3)

c) Since the delays clauses are linked to the general claims clause of C. S. R. A. , the Employer is allowed to influence the Engineer on matters relating to delays.

Chapter 9 - Extensions of Time

In terms of Clause 44 of G C C '82 the Contractor may claim for an extension of time over a very wide range of circumstances provided he complies with the time limit in which full and detailed particulars have been delivered to the Engineer.

In the Case of G C C '90, if the Contractor wishes to claim for an extension of time he has to do so in accordance with Clause 51 and once again the Engineer has the opportunity of neglecting to make a decision.

Clause 44 of C. S. R. A. requires that the Contractor claim for extension of time under Clause 53. The Engineer cannot possibly come to an unbiased decision with regard to extra time since Clause 44 requires him to consult with the Employer. Clause 20.2 of the ESKOM document requires the Contractor to claim for extension of time in accordance with the general claims clause, again allowing the Project Manager to neglect his duties. Clause 20.2 also requires that the extension of time take into account the concurrency of the delays. This is fair as the delays may have no effect on the critical path and decisions with regard to extensions of time should always take the critical path into account. The I. C. E Conditions of Contract probably handle extension of time in the best way. In terms of Clause 44 (1), delay for which the Employer is responsible is specifically included. This leaves no room for doubt. As with G C C '82 the Contractor has to within 28 days deliver full and detailed particulars of the claim, but Clause 44 (2) requires that the Engineer review the question of extension of time at least 3 times during the course of the Contract. This is the most equitable arrangement.

9.1. Conclusions

a) Once again the G C C '90, C. S. R. A. and ESKOM clauses are linked to the General Claims clauses subjecting them to the flaws discussed previously.

b) G C C '82 is closely allied to I. C. E. with respect to extensions of time and the I. C. E. clause is probably the most fair.

Chapter 10 - Payment

Payment clauses most relevant with regard to avoiding disputes, are considered to be the clauses relating to monthly payments, time of payment and correction or withholding of certificates. Payment in this chapter will be discussed accordingly.

10 1. Monthly Payments.

In the past Contractors have been very unhappy that there is no time limit to which the Engineer has to adhere to in processing the monthly certificate after receiving the Contractor's Statement. Clause 62 (1) mentions only that the Contractor shall be paid monthly. This has resulted in disputes over the inordinately long periods taken for the monthly certificates to be processed.
The G C C '90 document has improved this situation. In terms of Clause 52 (4), the Engineer must deliver payment certificates within 21 days after receipt of the Contractor's statement.
The C. S. R. A. monthly payments clause (Clause 62 (1)) also does not subject the Engineer to any time limits, nor does the ESKOM document (Clauses 29.1 and 29.2)
The I. C. E General Conditions of Contract do require the Engineer to certify payment within 28 days of delivery of the Contractor's monthly statement (Clause 60 (2))

10. 2. Time of Payment

Clause 62 (3) of G C C '82 requires that the Employer pay the Contractor within the number of days named in the tender. However, since Clause 62 (1) does not provide for a time limit, payment could also be delayed.

The G C C '90 document specifies a time limit of 35 days in which the Employer has to pay the Contractor after receipt by the Engineer of the

Contractors statement. This requirement should do much to prevent disputes in this regard.

C. S. R. A. specified a time limit of 14 days after delivery of the certificate to the Employer. Payment could be delayed due to delay in provision of the certificate, however.

The ESKOM document requires that the Contractor be paid within the number of days stated in the schedule but again there could be delay with regard to certifying the Contractor's statement.

The I. C. E. document requires that the Employer pay the Contractor on certification (within 28 days of receipt of the Contractor's statement).

10. 3. Correction or Withdrawing of Certificates

G C C '82, C. S. R. A, ESKOM and I. C. E. documents allow the Engineer or Project Manager to correct or amend any certificates issued previously and to withhold certification on any part of the works not completed to his satisfaction. The latter power of the Engineer has resulted in lengthy disputes as in the case of Richtown Construction Co. (Pty) Ltd. vs Witbank Town Council .[37] As pointed out by Loots [23], it is not clear whether the Engineer is entitled to withhold large sums due against a small part of the work not done to his satisfaction.

G C C '90 appears to have done away with this power of the Engineer, thus reducing the potential for dispute.

10. 4. Conclusions.

The G C C '90 document appears to be the most fair with regard to the timeous payment of amounts due to the Contractor and withholding of certificates.

Chapter 11 - Disputes.

In terms of Clause 69 (1) (C) (i) of G C C '90 the Engineer has to consult the Employer before giving a decision on a dispute making it no longer solely his decision and eroding his powers. Also in terms of Clause 69 1 (C) (iii) the Engineer again has the opportunity of neglecting his duty to make a decision. In terms of Clause 69 (2) of C. S. R. A. if the Contractor is dissatisfied with the Engineer's decision it has to be referred to the Employer. Also in terms of Clause 69 (4), the Employer's decision, opinion, certificate or valuation on:

a) The true intent or meaning of the drawings.

b) The quality of the work carried out by the Contractor or the materials supplied by him.

c) Any requirements of the Employer in respect of any matter referred to in Clause 16 (removal of workmen) shall be final and binding and not subject to appeal. This is hardly an equitable situation.

The G C C '82 and ESKOM documents handle disputes in a similar fashion. The dispute is firstly referred to the Engineer or Project Manager. If the Contractor is not satisfied with his decision it is referred to a mediator. The Employer has no role in the decision making process with respect to disputes. The I. C. E. document also makes decisions on disputes the prerogative of the Engineer but it does not provide for mediation. This is not good.

11. 1. Conclusions.

1. The G C C '82 and ESKOM documents provide the most equitable arrangement with regard to handling disputes, as the Employer plays no role in deciding on disputes.

2. The I. C. E. document makes no provision for mediation. The merits of mediation were shown in Section A and all documents should include a mediation clause.

Thesis Synthesis

Chapter 12

12.1. General

Time, Cost and Quality are the chief considerations with respect to contract performance and their interrelation is the root cause of all major disputes i.e. the primary cause. The difference in attitude to the above creates potential for dispute and an imbalance between Time, Cost and Quality can also give rise to disputes.

The most important secondary causes of dispute are Risk, Variations and Alterations, Delays, Claims, Adverse Physical Conditions, Extensions of Time and Payment.

All the secondary causes of disputes are risk related and a consideration of risk is thus extremely important with regard to avoiding disputes. With regard to handling risk, risk should first be identified. Once the risks have been identified an attempt should be made to reduce them by means of thorough site investigations, good management and planning and clear unambiguous Conditions of Contract.

After risk identification and reduction, risk should be allocated contractually in a fair way by adhering to sound principles of risk allocation. Intelligent treatment of risk, i.e. the adherence to the principles mentioned above, will do a great deal towards minimizing disputes. Every attempt should be made to resolve disputes at site level and if for some reason they cannot be, mediation is a far better alternative than arbitration or litigation.

Relevant facts pertaining to causes of disputes leading to mediation or arbitration should be made available to prevent similar mistakes being made. Research in this respect proved to be extremely difficult and the task would have been made far easier if the results of mediation and arbitration were published. Every Contract Document should contain a Mediation Clause, so

that disputes can be dealt with without conflict.

12.2 General Conditions of Contract

With regard to the relevant clauses of the respective General Conditions of Contract, the following conclusions, as mentioned previously, were drawn:

12.2.1. Risk

a) The G C C' 90 and I. C. E. Care of Works clauses are likely to be more effective than the corresponding clauses of the other documents because they both contain a clear definition of transfer of responsibility from the Contractor to the Employer. In this respect the G C C' 90 clause represents a welcome improvement on the G C C' 82 clause

b) With respect to the excepted risk clause, the G C C '90 clause is again more likely to be effective than the G C C' 82 clause since it includes causes due to instructions and specifications of the Employer and his agents or servants.

12.2.2. : Variations and Alterations

a) The G C C '90, ESKOM and I. C. E documents allow the Engineer (or Project Manager in the case of ESKOM) to order a variation order to change the approved sequence or method of construction. This power is likely to result in dispute.

b) Much has been done in the G C C '90 document to clarify the valuation of variations and the G C C '90 clause is a definite improvement on the G C C '82 clause.

c) Both C.S.R.A. and the ESKOM documents require the Employer's approval with respect to valuation of variations. This undermines the authority of the Engineer and results in a situation that is not equitable. C. S. R. A. is a poor

document in this respect and Clause 2 of C. S. R. A. renders the Engineer powerless and creates a situation in which it is impossible for the Engineer to be impartial.

d) None of the documents have much clarity with respect to the power of the Engineer with regard to increasing or decreasing the Contract value in the case of variations exceeding a certain percentage.

12.2.3 Claims and Adverse Physical Conditions

a) Clauses relating to adverse physical conditions are very similar in all the documents. The ambiguous phrase "could have been reasonably foreseen by an experienced Contractor" is present throughout. To avoid disputes in this regard the clause should specify that if the Contractor encounters conditions worse than described in the documents he is entitled to claim for extra payment.

b) The relevant clause of the ESKOM document places unnecessary risk on the Contractor by specifying earthworks below ground surfaces as the only situation where the Contractor can claim adverse physical conditions.

c) Records of facts and circumstances relating to claims and procedure regarding claims (including adverse physical conditions), in the case of G C C '90, C. S. R. A. and ESKOM are dealt with by general claims clauses which are entirely unreasonable in their requirements and are conducive to disputes.

d) In the case of C. S. R. A. it is required that records relating to claims be made available to the Employer. The Engineer's decision with regard to claims cannot therefore be impartial.

e) The G C C '90 and ESKOM documents allow the Engineer and Project Manager to neglect their duties with regard to deciding on claims issues.

f) Of all the documents the Adverse physical conditions and claims clauses of G C C '82 and I. C. E. documents are most likely to be effective although they

also have shortcomings which can be improved on, such as the phrase "could have been reasonably foreseen by an experienced contractor".

12.2.4 - Delays

a) If one has to condiser the real difference in the way the respective documents deal with delays, it is with respect to how the Contractor has to claim for these delays, because if the Contractor is adequately compensated for delays suffered there should be minimal disputes. In the case of C. S. R. A., G C C '90 and ESKOM all claims concerning delays have to be made in accordance with a general claims clause which as discussed previously involve unfair and unreasonable requirements. In this respect the G C C '82 clause 42 is probably the only clause which is really fair, since the Engineer is obligated to grant extension of time and extra payment if the cause of the delay is due to the Employer, as would be the case in a common law contract. The Contractor does not need to claim, let alone comply with an unreasonable claims procedure.

b) Since delays in the G C C '90 document and the ESKOM document are linked to the general claims clauses, the Engineer and Project Manager are allowed to neglect their duty to decide on claims related to delays (See conclusions, Chapter 3)

c) Since the delays clauses are linked to the general claims clause of C. S. R. A. , the Employer is allowed to influence the Engineer on matters relating to delays.

12.2.5 - Claims

a) Once again the G C C '90, C. S. R. A. and ESKOM clauses are linked to the General Claims clauses subjecting them to the flaws discussed previously.

b) G C C '82 is closely allied to I. C. E. with respect to extensions of time and the I. C. E. clause is probably the most fair.

12.2.6 - **Payment**

The G C C '90 document appears to be the most fair with regard to the timeous payment of amounts due to the Contractor and withholding of certificates.

12.2.7 - **Disputes**

The G C C '82 and ESKOM documents provide the most equitable arrangement with regard to handling disputes, as the Employer plays no role in deciding disputes.

Chapter 13 - Conclusions and Recommendations

13. 1. Conclusions

13.1.1. - General

a Time, Cost and Quality are the most important variables with regard to avoiding contractual disputes.

b) Risk is an extremely important consideration and all other causes of dispute are risk related.

13.1.2 - General Conditions of Contract

a) With respect to Care of Works, Excepted Risks, Valuation of Variations, Monthly Payments, Time of Payment and Correction or Withholding of Certificates, the General Conditions of Contract 1990 modifications represent a definite improvement on the General Conditions of Contract 1982.

b) However, with respect to Claims, the General Conditions of Contract 1990 document is conducive to a high incidence of disputes. By linking the general claims clause to Adverse Physical Conditions, Delays and Extensions of Time, these clauses are also conducive to a high incidence of disputes. The C..S..R..A. and ESKOM documents have the same shortcomings in this regard.

c) The C. S. R. A. document is extremely biased in favour of the Employer and the provisions of Clause 2 of C. S. R. A. render the Engineer effectively powerless.

d) The trend in this country appears to be in favour of the Employer, as both the G C C '90 document and the ESKOM document are now more closely allied to the C. S. R. A. document than to the I. C. E. document.

e) It has been suggested that the Contractor's delegates on the committee selected to revise the General Conditions were not truly representative. However, there is substantial evidence, that many Contractors did object to the claims clause of the G. C. C. '90 document at an early stage of the revision, but these objections were disregarded.

In conclusion it should be borne in mind that as pointed out by Tony Hallier [19] our contract documents "are attempting to deal with incredibly wide and difficult sets of circumstances" and if contracts are handled intelligently by the parties involved, disputes can be kept to a minimum despite the shortcomings of Conditions of Contract.

13.2 Recommendations

a) Further research is needed on the subject of Risk, as intelligent treatment of risk in the future will do much to alleviate contractual disputes.

b) Relevant facts pertaining to causes of disputes leading to mediation or arbitration should be made available to prevent similar mistakes being made. A far more comprehensive study of disputes could be made if the above was realised.

c) All parties involved in Civil Engineering Contracts should be represented equally in future revisions of contract documents.

d) The entire C. S. R. A. document and Clauses 51 and 34 of G C C '90 and ESKOM respectively should be treated with extreme caution by Contractors.

e) This thesis can serve as a reference as to which are the major causes of dispute, and as to how the respective General Conditions of Contract in this Country handle the circumstances relating to these disputes.

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