

**NEPAL  
BPEP II**

**Study of JEMC for Upgrading and for  
Printing of SLC Examination Papers**

Tony Ashe  
November – December 2001



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# 1 INTRODUCTION

## 1.1 Background

This visit follows the installation of bindery equipment and management systems at Janak Education Materials Centre, located at Sano Thimi, Bhaktapur, Nepal which was previously documented in the summer of 2000.

## 1.2 Main objectives of visit and meetings held

The visit took place from 19 November to 8 December 2001.

The main objectives of the visit were:

- a) to follow up progress on the previously-installed equipment and systems at JEMC, and to report upon that progress, together with an analysis of the action to be taken to remedy any problems found.
- b) to assess the feasibility of producing School Leaving Certificate Examination papers within Nepal, and to report on the steps which would need to be taken in order to achieve this.

In the course of this visit, the consultant was mainly based at Janak Educational Materials Centre at Sano Thimi, Bhaktapur, spending time with Mr. Ram Chandra Silwal (Printing Department Manager), Mr. Subarna Man Pradhan (joint Deputy Managing Director), Mr. Padmananda Shrestha (in charge of Costing and Estimating, and some aspects of finance), and Mr. Sharad Chandra Upadhyay (joint Deputy Managing Director).

Meetings were also held with Dr S. D. Bhatt, Joint Secretary at the Office of the Controller of Examinations (Sano Thimi, Bhaktapur), and with Dr Khedar N. Shrestha, Deputy Team Leader, Second Secondary Education Project Preparation, Technical Assistance.

Additionally, a visit was made to HMG of Nepal, Ministry of Information and communications Department of Printing at Singh Durbar, Kathmandu; where Mr Narayan Prasad Lamsal (the Director General), and Mr Ganesh Bahadur Bhattarai (the Production Manager) were kind enough to give a conducted tour of the facilities.

Mr Kayestha, the Heidelberg agent in Nepal, very kindly arranged for a visit to two local commercial printers.

### Abbreviations

BPEP	Basic and Primary Education Programme
HMG	His Majesty's Government of Nepal
IBD	International Book Development Ltd
JEMC	Janak Education Materials Centre
OCE	Office of the Controller of Examinations



## **A                    The current situation at Janak Education Materials Centre**

### **2                    GENERAL IMPRESSIONS OF THE NEW SYSTEMS AT JEMC**

#### **2.1                The Quality Assurance System**

This is operating as planned. The consultant visited every department within the factory. In each department, the supervisors were using the correct forms, and the forms are kept to hand and up to date.

#### **2.2                The Production Control System**

The Production Control boards are on the wall of both the printing department and the bindery. There are job slips in position on the boards. Apparently progress of jobs through the factory are discussed at the daily manager's meeting. However, it is not certain that the system is, in fact, routinely being used on a day-to-day basis.

#### **2.3                The Costing and Estimating System**

The system is in use. It would seem, however, that it is only really being used for estimating. Four staff have been assigned to the collection of data – but Mr Padmananda Shrestha says this 'is not yet complete'. Since the consultant's last visit was a year ago, and an undertaking was given at that time that the system would be completed by January of this year, this is not satisfactory. In fact, the data should be being collected via the daily job sheets from the production departments, and then collated into cost records on a daily basis.



### **3 CONCLUSIONS**

#### **3.1 The Quality Assurance System**

There is general acceptance of the system as a necessary and normal part of everyday management of the plant. Staff are convinced that the system is relevant and serves a useful purpose. This acceptance is probably because the production manager has championed the system from its inception, and continues to support and encourage its use. Definitely a success.

#### **3.2 The Production Control System**

Although apparently in use, it really is not regarded as a necessary tool. This may be because of the repetitive nature of the workload – staff do not accept the necessity of accurately monitoring progress as a means of controlling it. There is also the fact that the system lacks a ‘champion’. At best this can only be regarded as a partial success.

#### **3.3 Costing and Estimating**

This really is a disappointment. It is quite obvious that the reasons for such a system are not really understood by the staff in charge of it. It seems that the installation of the system itself is seen as part of a price which must be paid in order to ensure continuing donor support.

Sample daily record sheets were provided at the start of the project, but these are not being used. Instead of actual production hours being recorded against projects, the daily sheets merely record the date, the number of operatives (largely irrelevant), the number of sheets produced (again largely irrelevant), and the job being produced. In fact the daily sheets are the ones which were already in use, and only document complete days. This information is insufficiently accurate for costing purposes, and will not allow proper comparison of estimated against actual cost – the whole purpose of a costing and estimating system. It is clear that the fundamental point has been missed. The system was explained again – but it is doubtful if this will result in any real effort being made to install the system as it should be used. Again, only a partial success, because at least it is being used properly for estimating.

#### **3.4 General conclusions on the new systems at JEMC**

Some of the above is disappointing; but merely highlights the underlying problem, which has been highlighted in several previous reports. JEMC as an organisation does not have the basic management skills to implement modern management practices. The lack of a conventional management structure makes it difficult to manage the business on anything more than a day-to-day level. Management roles are not properly defined and responsibilities are not always clear.

It should be emphasised that this is not a criticism of the present management, merely a reflection of the way the business has grown. This shortcoming has been highlighted in every report so far, and recommendations have been made on how change might be implemented.

One of the consultant’s Terms of Reference is to ‘assess the management system needs to . . . . . install a modern management infrastructure . . . comparable to that in private sector printing houses’ (see Appendix I).

Frankly, the latter is almost impossible in the current situation. Imposing conditions from outside will not work, unless those working inside the organisation recognise the problems, and are prepared to be committed to, and involved in, the solutions. The first task is to get the whole management team to recognise that current practices are not sufficiently effective, that the business is not as well-run as it could be, and that fundamental changes are needed to address the situation. A good start for this

process would be a study tour of well-managed printing businesses. Such a tour would help to dispel some of the complacency – particularly if the tour concentrated on the next generation of managers, some of whom are likely to be promoted within the next 2 or 3 years. It would also show what can be, and is being, achieved by other organisations some of whom will provide formidable competition over the next few years. Once the weaknesses within JEMC have been demonstrated and accepted, then proper management training can commence.

It is clear that any training would have to begin with the basic structure of a business, building up from that base to define the role of every function of the business, and how all the various parts fit together to make a strong whole. Since JEMC in effect invented itself, this whole concept is missing. Some, at least, of this foundation training could be done by a consultant, taking the management team off-site somewhere locally, and just working through the basics. Most management courses assume some knowledge of the workings of a business; which in this case is totally lacking. It would be unfair to send trainees to college under this sort of disadvantage, because they would start so far behind the rest of the class (leaving aside for the moment the poor quality of many of the junior management). This may be the right stage to weed out some of the weaker staff. In some cases, replacement may be an option; however, the general over-manning within the factory applies equally across much of the management.

Having got the management team to acknowledge the faults in the present system, and having given them the basic training to understand what is wrong, and what should be done to put it right; thought can be given to building a sound management structure. The team must be involved in this process, and must provide input from the inception. Otherwise, they will not 'own' it, and certainly will not have the commitment to make it work. What is needed is advice and guidance, but certain fundamental problems must be addressed. As has been recorded in several previous reports, there is no real understanding of the roles played in the running of a business by the different departments, and how these roles work together to manage the everyday working of that business. An outline of the proposed long term plan will be found in section 4.2

However, it is unlikely that any real change can take place under the present regime of Government ownership. There simply is no motivation for change – in fact, quite the opposite. While JEMC is under political control, political considerations will always dominate the way it is managed and run, and management decisions will continue to be driven by the short-term needs of their political masters, rather than by the long-term needs of a modern business.

In short, the point has been reached at which very little more can be done without a complete restructuring of the way the organisation is managed.

## **4 RECOMMENDED NEXT STEPS**

### **4.1 Study Tour**

Unfortunately, there are no suitable businesses in Nepal for the purposes of the study tour described in section 3.4. It will therefore be necessary to arrange for a visit to India or to somewhere like Singapore, where there is a flourishing and successful printing industry, organised very much on modern principles. India obviously would be the cheaper option, but there may be political objections, and Singapore offers a wider choice of suitable hosts – as well as a slightly more competitive environment and management style.

Whichever destination is chosen, the objectives of the tour should be clearly laid down before any donor commitment is made, and the delegates should be carefully chosen. The tour will act as a reward and an inducement to some of the more promising management trainees to participate more fully in the re-structuring process.

The main objectives of the tour is the opportunity to compare and contrast management styles and structures within the two differing environments, and for the businesses visited to provide a model for future progress at JEMC. A report on this comparison, together with an outline plan of suggested changes, must be a condition of participation in the tour for every delegate. These reports will then form the basis of the process of re-designing and reforming the management structure at JEMC. As has been said before, it is essential that the managers should accept 'ownership' of, and responsibility for, the new structure.

A further benefit of the tour is to introduce JEMC staff to the general concept of competition, and how competition acts to drive management strategies in a commercial environment.

### **4.2 Outline of long term plan**

The study tour will highlight many of the shortcomings of the present way of managing JEMC's business, and will also suggest improvements which could be made. However this is only the first step in a long and hard process.

This foundation must then be built upon by a programme of general management training, which will give the background knowledge needed to take the next steps – re-designing and building a management structure to take JEMC forward into the future. As was noted earlier, the problem is a fundamental lack of experience and management training. Most of the management team are aware that the present management approach is not right, but there is no existing body of knowledge to analyse the situation, or to act upon the analysis. It is necessary to access that knowledge quickly, and the best way to do this is to give the team the sort of basic skills that would routinely be available to their equivalents elsewhere. It may be that suitable basic management courses are available at colleges within Nepal. This needs to be researched as a matter of urgency. If suitable courses are not available, then in-country training can be provided by consultants. The process could be speeded up and strengthened by recruiting qualified managers who already have the required skills. It may be difficult to attract suitable applicants, because of the relatively low salary levels and a general reluctance to work within the public sector.

Having highlighted the problems, provided the training needed to quantify them, and the skills to devise solutions to them; the next step is to help the team to design, build, and install, a management infrastructure which will be capable of managing and directing the business for the next ten years or so. It is essential to have the team's complete commitment to this process. The price to be paid for that commitment may be a slightly less than perfect structure. However, it is better to have a structure

that is less than perfect, but works, than a theoretically perfect structure which fails through lack of team commitment.

### **4.3 Summary**

So, the process has to be:

1. Organise a study tour – to highlight the current shortcomings, to suggest alternative strategies, and to help to provide the context to develop a long-term plan for JEMC.
2. Arrange general management training – to provide the background knowledge which is needed to understand the problems and what has to be done to resolve them, and to help to develop the skills needed to draw up a long-term plan for JEMC.
3. Assist the management team to draw up a long-term plan for JEMC along with a comprehensive human resource development plan.
4. Assist the management team to use the skills and knowledge acquired during the earlier steps in the process to design a management infrastructure which truly involves all the participants, and to which all the team members are completely committed, and of which they claim complete ‘ownership’.
5. With the management team, plan a programme of specific training (including study tours).

The resulting management team will provide the foundation on which to build a strong and secure business, capable of succeeding in an increasingly competitive and global environment.

*Considerable consultant assistance and support will be needed throughout the management restructuring process, see section 7.4 for more details*

**THE USE OF THE PRE-PRESS EQUIPMENT AND THE COMPETENCE OF THE STAFF IN THE PRE-PRESS DEPARTMENT**

During the consultant's visit, this department was visited frequently, and on every occasion the pre-press equipment was in regular use. The staff are well-trained and competent, and the equipment is being used properly. From conversations with the staff, it is clear that they have a complete understanding of the workings of the equipment, and are thoroughly conversant with its use. This installation appears to be a complete success.



**6                    CONDITION AND USE/STORAGE OF THE OF THE NEW BINDING  
EQUIPMENT**

The consultant visited the new bindery area on several occasions. In each case, only part of the equipment was in use, because the durable textbook programme is temporarily suspended. However, the machinery in use was being properly managed, and the staff were working competently. The machinery not in use was well covered, to protect against dust and moisture; and all the machinery appeared to be well-maintained, and in good working order.



**7 OUTLINE OF A LONG-TERM PLAN FOR THE UPGRADING OF JEMC TO PRINT PRIMARY AND SECONDARY SCHOOL TEXTBOOKS**

**7.1 Outline of the stages of development needed for upgrading JEMC**

- a) A sound programme of general management training, beginning with basic management skills; and progressing to more specific areas, such as production management, costing, finance, marketing etc. Particular attention needs to be paid to management roles, and their functions, especially their relationship to, and with, each other. Some of this training may be available locally – investigation will be necessary to find suitable sources, and to establish estimated costs.
- b) An evaluation and calculation of the total workload which will be involved in the production of primary and secondary school textbooks.
- c) Based on this evaluation, an estimate of the technical assistance and extra machinery which will be needed. Much of the present equipment is now outdated and some will need replacement. Costs needed to be estimated. Manning levels should be set at modern competitive levels, and not dictated by custom and practice.
- d) The management structure needs to be re-defined and designed to manage the production of primary and secondary schoolbooks, so as to deliver an acceptable product on time.
- e) Again based on the evaluation mentioned in b) above, an estimate of the changes needed to the buildings and structure at Sano Thimi, in order to accommodate the revised machinery. Costs to be estimated.

**7.2 Critical Achievement Points**

The implementation of each stage of development should be subject to critical achievement points or ‘milestones’ in the form of the satisfactory meeting of set criteria by JEMC management. It is difficult to set definitive criteria at this point, without knowing exactly how much development will be needed, but suitable achievement points could be based on the following:

**7.2.1 Milestone A**

The first step is the establishment of the basic management training programme (see 7.1.a) above), and the first milestone is the reaching of a satisfactory level of understanding of the process of management as practised outside Nepal. This is crucial to the whole project, but the commencement of training should be conditional upon a clear acceptance of the need for changes to the management structure, and total and guaranteed commitment to making those changes. This would involve the JEMC management, the Ministry of Education, and, most importantly, His Majesty’s Government of Nepal.

**7.2.2 Milestone B**

Following the basic management training programme, the next ‘milestone’ should be a determined effort to bring manning levels at the factory into line with those in private industry. Most machines in the plant are over-manned by at least 400%; and this issue needs to be addressed if JEMC are to have any hope of becoming competitive with the private sector (even within Nepal). Again, this is likely to require involvement with HMG of Nepal, because of the political implications of the resulting unemployment.

### 7.2.3 Milestone C

Cleaning-up and tidying the entire plant. Much of the site is filthy, and needs a determined campaign to bring it up to the standards found in the private sector. As noted earlier in this report, some effort has been made to tidy floor areas within the factory, but the ceilings are covered in dirt and cobwebs, and work in progress is stacked untidily and unsafely in every corner. Office areas are no better, and the entire site feels neglected; which does not encourage good working practices.

### 7.2.4 Milestone D

To demonstrate commitment to future reforms, full implementation of the systems already installed at JEMC should form one of the primary evaluation criteria for further investment. Effective production control and proper costing and estimating are both fundamental requirements for a modern business.

### 7.2.5 Milestone E

The most important 'milestone' is a firm and concrete commitment from JEMC management and HMG of Nepal, to the complete re-structuring of the way JEMC is managed and run. This is fundamental to the long-term future of JEMC. Without this commitment, there can be no possibility of installing a modern management infrastructure – merely a continuation of the frustration which has arisen from the attempt to graft modern management techniques onto a flawed and ineffectual management structure. This particular achievement point should be at the beginning of the process, and consideration should be given as to how this might affect decisions on future funding.

## 7.3 The need to introduce competition

The consultant has severe reservations about confirming JEMC as a monopoly supplier of school textbooks and believes the monopoly status of JEMC should be changed. Once the upgrading has reached a reasonable stage, it would be prudent and useful to obtain competitive prices for the supply of school textbooks. There are other printers within Nepal who, although currently limited in facilities, have the potential to provide partial competition of this nature; and it would seem sensible also to seek comparative prices from suppliers outside Nepal. The ability of JEMC to match other printers in supplying value for money would be a real benchmark of progress.

## 7.4 Technical Assistance Requirement

Consultant involvement will be necessary for this whole process, because it is difficult for those working within an organisation for some time to have a sufficiently clear vision of the objective and to be able to generate enough energy for the process of change.

TECHNICAL ASSISTANCE NO.	TASK	DURATION	TIMING
1	Agree and implement basic management training	2 weeks	March 2002
2	Evaluate management training and implementation of previously-installed systems (milestone D)	1 week	April 2002
3	Calculate likely workload	1 week	April 2002
4	Estimate technical assistance and machinery requirements & set manning levels	2 weeks	May 2002
5	Discuss and agree management re-structuring	1 week	June 2002
6	Assist with and facilitate implementation of management re-structuring	1 week	June 2002
7	Continue with management re-structuring	2 weeks	July 2002

Full implementation of the management re-structuring will need ongoing consultant input after the initial stages (Technical Assistance Nos. 5-7) – in the form of further visits, probably of shorter duration, to monitor and evaluate progress, and to give help as required. This continuing part of the process will need its own milestones which can be agreed and set at the planning stage (Technical Assistance No. 5).



## **B                    Printing Examination Papers at Janak Education Materials Centre**

### **8                    AN ASSESSMENT OF THE ISSUES INVOLVED IN PRINTING EXAMINATION PAPERS**

#### **8.1                Background**

The Nepal Examination Council provided information, prior to the consultant's visit, on the subjects, quantities, and levels of Examination papers, as currently produced. As part of the evaluation, a visit was paid to the Office of the Controller of Examinations (OCE) at Sano Thimi, and a meeting was held with Dr Bhatt. Dr Bhatt explained the current procedure for the production of Examination Papers, and a summary of that procedure will be found in Appendix II (see page 18).

A meeting was also held with Dr Kedar N. Shrestha, Deputy Team Leader, Second Secondary Education Project Preparation, Technical Assistance. A report of that meeting appears in Appendix III.

#### **8.2                Security considerations**

It is clear that the over-riding factor in the printing of examination papers within Nepal is that of security. This would be the case in any sort of security printing, but the situation is even more serious in Nepal, because of the unique importance of the School Leaving Certificate Examination, combined with the difficulty of travelling to the examination centres – in many areas this involves long journeys on foot. Therefore a security leak, particularly if it resulted in postponement of the SLC examination, would have enormous political consequences.

A further factor is the fact that Nepal is a poor country, in which the salaries of Government employees are extremely low. Since the School Leaving Certificate is the most important examination in the country, and many relatively well-off families would be prepared to pay a large sum of money for an illegal copy of the question paper, this makes the process of producing the papers in-country a high-risk operation.

#### **8.3                Technical considerations**

The large quantities involved make the choice of conventional printing equipment almost inevitable. Photocopying or digital printing just is not practical for this volume of output.

However, there is considerable variation in the estimates of the amount to be produced. In 2001 the total quantity of examination papers produced was 2,899,000 papers, which varied in extent between 2 and 10 pages. Current predictions are that the number of examination papers will rise by about 20% per year, as student numbers increase due to better access to education, and population increases. There is a strong suggestion that examination paper page extents are likely to double, although no firm time scale for this was available.

Yet another factor is that, although present examination papers could be produced as A5 (210 x 148 mm), which is an economical and simple size to print, there is a move to combine question papers with answer papers – which need to be A4 (297 x 210 mm), effectively doubling the size of the papers again, with the obvious effect on the amounts to be produced.

The consultant's Terms of Reference for this visit called for an evaluation of the resources which would be necessary to produce Examination Papers for the next fifteen years. Because of all the

factors documented in the previous paragraphs, an accurate estimate of the work involved for requested time scale of fifteen years is not possible – there just are too many possible variations; all of which would produce widely differing requirements.

The consultant has therefore taken the two most likely scenarios, i.e. the present page extent, and the doubled page extent, each with a 20% increase in quantities, and projected the effects for the next two years. The machinery required for these two scenarios is listed in Appendix IV, together with a very approximate estimate of the costs.

## 9 CONCLUSIONS

### 9.1 Suitable Sites for printing Examination Papers

Three sites were suggested: the Government's own security printing unit in Singh Durbar, Kathmandu; the Office of the Controller of Examinations (OCE) at Sano Thimi, Bhaktapur; and the Janak Educational Materials Centre, also at Sano Thimi. All three sites were visited.

The security printing unit has excellent primary security – it is contained within a secure site at Singh Durbar (the Parliament building is within the same complex, and there are Royal Nepal Army personnel permanently on duty). It would be possible to set up a suitable plant, however the present printing facilities are relatively small in scale, and there is no managerial experience of producing large volumes within short timescales.

The OCE has no facilities for printing, no experience of the process, no supply of 3-phase electricity, and insufficient space to install machinery. Of the three suggested sites, this one is the least practical.

JEMC have existing facilities for printing, and considerable experience of the processes. There is sufficient suitable space to install the necessary machinery, and it is almost next door to the OCE, who would, in effect, control the production of the papers.

Of the three suggested sites, the security unit at Singh Durbar and at JEMC would be most practical.

### 9.2 Security issues

In the consultant's view, the following are the minimum requirements which should be considered:

- Security checks on all staff employed within the Examination paper production area, all staff must be screened for honesty and past records.
- Minimum access; one small door for staff, one larger door for the movement of materials – which means that restricting access to authorised personnel will be comparatively simple.
- Reliable security personnel on both doors at all times, plus 24-hour closed-circuit television to monitor the surroundings and some of the less-frequently used internal areas. In order for the closed-circuit television to be effective, it would be necessary to floodlight the surroundings. The alternative would be infra-red CCTV; which would be prohibitively expensive.
- Wearing of security badges at all times by all personnel. Visitors would have to be kept to a minimum, and special arrangements made for security during such visits.
- Sequential numbering of examination papers after printing and binding (which has implications for wastage etc.). All waste materials to be kept inside secure unit until production is completed
- A system by which all personnel change their clothes completely when entering or leaving the secure area – which means the provision of a secure and monitored changing room.
- Reinforcement of doors, windows, roofs etc. with sturdy steel mesh, together with a reliable alarm system to warn of any tampering.
- The only sure way of guarding against the memorisation and later reproduction of Examination questions is for all staff to remain on site until the work is complete, with total sealing-off of

secure unit for duration of production. This will obviously involve the provision of sleeping and sanitary facilities, food and water supplies etc., together with some arrangement to cover emergencies such as sickness, accident etc.

- Production cycle to be as short as possible – suggested target is 20 days
- The Examination production unit will have to be completely separated from the rest of the factory, which means complete self-sufficiency as far as machinery is concerned. The unit therefore will need its own platemaking, printing, folding, wirestitching and cutting machines.
- Naturally, complete commitment to meeting these requirements should be obtained from HMG of Nepal and JEMC before any work is undertaken

### **9.3 Technical issues**

As already mentioned, the most practical method of producing the large quantities involved is a combination of at least one large-capacity press, to cope with the large extent, long run papers; and a reprographic unit to print the smaller papers. The choice of printing method will affect the choice of platemaking facilities, and the type of folding and trimming machines. It is recommended that consideration should be given to gluing and trimming the smaller extent papers on the folder – this would save time in production and some capital expenditure on plant. For security purposes the papers should be sequentially numbered, and this operation should be carried out after binding and trimming – i.e. individual papers would be numbered, so as to avoid re-numbering when unavoidable production problems cause waste.

The proposed machinery in Appendix IV includes a combination of large-format presses and very quick turn-round small format presses, together with similarly-configured folding and wire-stitching machines. This seems to offer the best solution for the scenarios as presently envisaged. A further possibility would be a small format mini-web press, also combined with small high speed presses. However, there seems little point in spending large amounts of time in calculation of machine requirements, until there is agreement as to what is to be produced.

Because of the need for total security, and the tight deadlines, it will be necessary to ensure continuity of production within the secure area.

To guarantee continuity of production within the secure area, most of the key machines will have to be duplicated, since it clearly would compromise security if any examination papers were to be produced within the main factory. The necessity to duplicate some of the plant clearly will increase the capital cost considerably.

## **10 RECOMMENDATIONS / NEXT STEPS**

### **10.1 Choice of a suitable site**

The consultant's recommendation would be for JEMC – largely on the grounds that JEMC, although they suffer from the management shortcomings referred to elsewhere in this report, already are familiar with the production of bulk printed materials to tight schedules, and their plant is the most suitable for modification. Addressing of the management re-structuring recommended in the earlier part of this report should be a pre-condition of any decision to produce examination papers at JEMC.

### **10.2 Security issues**

If the decision is taken to print examination papers in Nepal, then it would seem that JEMC probably is the best site for the production. They have considerable experience of producing security materials, in the form of ballot papers. Also, they have produced examination papers on two previous occasions – apparently without any leaks.

There are areas within the older part of the JEMC plant which are suitable for the installation of the necessary machinery. These areas can be isolated for purposes of security relatively cheaply and easily, merely by building doorways into existing passageways. The site itself is some distance from Kathmandu, and already has an element of primary security in the form of constant patrols by security staff during working hours.

The security requirements documented in this report are the minimum which the consultant would consider adequate, and it may be that the MOES and/or HMG of Nepal would insist on further measures being taken.

Wherever the production takes place, the security requirements will broadly be the same, and detailed specifications will have to be drawn up so as to obtain suitable tenders for the necessary equipment and the provision of facilities.

The consultant suggests that, if JEMC are chosen as the supplier, then they should be prepared to invest the time and resources needed to prepare suitable areas within their factory.

### **10.3 Technical issues**

At the moment it is not clear exactly what the requirements for examination papers are likely to be. A decision on these is essential before any further progress can be made.

A point to bear in mind when calculating equipment etc., is that the manning of any new plant should be set at competitive and sensible levels, and these should be agreed before any commitment is made.

Even with the provision of accurate information on the exact form the examination papers will take, it would be impractical to predict needs for a longer time-scale than about 5 years.

#### 10.4 Technical Assistance

Some of these tasks could be combined with the Technical Assistance tasks.

TECHNICAL ASSISTANCE NO.	TASK	DURATION	TIMING
1	Agree quantities, extents and sizes of examination papers }	1 week	March 2002
2	Estimate facilities, equipment and training requirements }		
3	Prepare detailed specifications for tender	1 week	April 2002
4	Put specifications out for tender, receive tenders	6 weeks	May/June 2002
5	Evaluate tenders, choose supplier(s)	1 week	June 2002
6	Place orders, finalise details	1 week	June 2002
7	Prepare buildings etc.	2 weeks	July 2002
8	Install equipment, monitor installation	6 weeks	Aug/Sept 2002

## **APPENDIX I**

### **CONSULTANT'S TERMS OF REFERENCE**

For the current situation at JEMC, the consultant's brief was:

1. Monitor and evaluate progress at JEMC on the implementation of the following specific print production management systems:

- Quality assurance
- Production control
- Costing and estimating

In addition, monitor and evaluate the use of the prepress equipment and the competence of staff in the Prepress department (equipment and training on the equipment, with the exception of training on the imagesetter, were provided by Danida in the context of the durable textbooks experiment). Check upon the condition and use/storage of the binding equipment also provided by Danida.

Report upon progress, analyse the causes of lack of progress or failure to implement fully the systems and operations, propose action to remedy.

2. Assess the further management system needs in JEMC both to support the specific print production management systems (1 above) and to install a modern management infrastructure which will provide complete accountability across the whole spectrum of activities and responsibilities in JEMC to produce primary and secondary school textbooks. The modern management infrastructure will be comparable to that in private sector printing houses in order to promote market-oriented procedures which produce competitive printed products which represent good value for money.
3. Integrate the assessments and recommendations for 1 and 2 above into an outline long-term plan for the upgrading of JEMC to print primary and secondary school textbooks. This plan should include an outline of investments (equipment, training) and of a schedule which highlights critical achievement points and triggers (evaluation criteria) to go on to the next stage of development. Since the plan should be comprehensive (although only in outline), it will indicate the additional technical assistance inputs needed to specify equipment, training of various sorts (management and technical), building rehabilitation, etc.

For the printing of examination papers at JEMC, the consultant's brief was:

1. On the basis of the information provided by JEMC and the Nepal Examination Council, assess the print production task involved in printing the SLC examination papers at JEMC under appropriate conditions of security. The information should include an estimate of the quantities needed over the next 15 years.
2. Assess JEMC's needs in terms of human resources, skills training, systems, equipment, raw materials, technical assistance, rehabilitated buildings, etc, to take on the task and to perform it adequately into the future.
3. In a brief report, state JEMC's needs (buildings, equipment, systems/procedures, training, etc) to print the School Leaving Certificate examination papers under conditions of security. Give an outline plan with a timetable of preparation and implementation steps.



## **APPENDIX II**

### **CURRENT PROCEDURE FOR PRODUCING EXAMINATION PAPERS**

- A set of examination papers are each written by several teachers for each subject; the end result may be anything up to 5 sets of complete examination papers for each subject.
- These papers, in the form of camera-ready copy, are sent by those writing them directly to Dr Bhatt at OCE. The examination papers are all 217 x 140mm, and vary in extent between 1 and 10 pages.
- All these sets of papers are taken to India by Dr Bhatt and one Section Officer from OCE. Once arrived in India, Dr Bhatt decides which questions are to be used – may be the whole of one set of questions, or may be some from each set.
- Dr Bhatt and the Section Officer stay in India for the printing of the papers (approximately 45 days for the main run, and a further 15 days for the re-examination papers later in the year). They oversee production, answer any queries, and proof read the papers.
- The printer produces the examination papers, under conditions of high security. Occasionally there are problems with incorrect quantities.
- Each subject is made up into sealed packets of 5, 10, 25, 50, and 100 papers.
- The sealed packets are then delivered by lorry to the OCE office at Sano Thimi
- OCE then make up the necessary batches of papers (still in their sealed packets) for each Examination Centre. Each batch is then sealed up by OCE staff.
- The batches are sent to the Police Office nearest to each Examination Centre, two days before the examination date. The batches of papers are then collected from the Police Office by the Examination Officer on the morning of the examination (he or she has to sign for them).
- Marking Schemes for each examination subject are produced at OCE at the time of the examinations, and are distributed directly to the Centres by OCE (via messenger).
- The cost of printing, packing, dispatching and transporting the examination papers in 2001 was Rs4,000,000.



## **APPENDIX III**

### **VISIT TO Dr SHRESTHA ON 27<sup>TH</sup> NOVEMBER 2001**

**People met:** Dr Kedar N. Shrestha, Deputy Team Leader, Second Secondary Education Project Preparation, Technical Assistance, METCON

Dr Shrestha was, until his recent retirement, an Assistant-Secretary at the Ministry of Education. He therefore has a huge knowledge of Education matters in Nepal generally, and his advice and experience are extremely valuable.

#### **Background**

The practice of printing Nepal's examination papers in India arose out of two factors. Firstly, there was, until 1978, no printer within the country capable of producing the volume of papers required. Secondly, and perhaps more importantly, there is the issue of security. There are always security risks involved in printing examination papers within their country of use. This risk is multiplied in a low-wage economy like that of Nepal, where a potential bribe can easily be the equivalent of a year's salary for the person supplying the illegal copy.

HMG of Nepal have now produced a Secondary Education Development (SED) Plan, following the implementation of the BPEP, and the Secondary plan proposes considerable changes to the Examination System in general – particularly as it applies to the School Leaving Certificate (SLC).

There has been much criticism of the SLC. This criticism is based on several issues. Because of the SLC's importance as the gateway to secondary education, and the gaining of employment (it is known colloquially as the 'Iron Gate') it is said to have a disproportionate effect on the teaching of Grades 9 and 10 – which are totally geared to achieving a pass in the SLC. It is seen as too rigid in its demands, resulting in a reliance on rote-learning, and the effective stifling of any form of experience-based learning. (However, despite this reported effect on the way teaching is carried out, the failure rate is extremely high. There is a strong possibility that this has more to do with the quality of teacher, than the way subjects are taught).

The main defence against this criticism has been the difficulty of altering or improving the present Examination, because the papers are produced in India. The argument is that the time-scale needed for the present procedure, and its inherent inflexibility, make reform of the paper format or structure practically impossible, since improvement to the Examination would almost certainly involve an increase in the number of pages, and probably some last-minute alterations.

Examination papers have been printed in Nepal on two previous occasions. Once as a result of the leakage of one or more papers prior to their delivery from India, making necessary the emergency production of replacement papers. The second occasion was rather more recent, and was caused by a dispute between the Governments of Nepal and India, following which OCE personnel were refused entry to India.

In both cases JEMC produced the Examination papers, and apparently without any reported leak. It must be pointed out, however, that the conditions under which the papers then were produced were fairly draconian – no-one was allowed to leave the premises while production was underway. There is also the fact that quantities were very much lower than they are now (almost 3 million papers in 2001).

### **Points arising in discussion**

Total security of Examination paper content is paramount. Any leakage of even a single paper would effectively render the whole examination invalid.

In Dr Shrestha's view, if Examination papers are to be produced in Nepal, then there are only two possible sites to be considered; the OCE office or JEMC. Since both are at Sano Thimi, and JEMC already has the required infrastructure in the form of 3-phase electricity, suitable structures, knowledge of the processes involved, and experienced staff; it would seem that JEMC is the more logical choice. If the papers were to be produced at JEMC, then it would be sensible for OCE staff to pack the papers into envelopes on the JEMC site, immediately following the final production process.

Dr Shrestha pointed out that JEMC would have the use of the machinery during periods when Examination papers were not being produced. He feels that this might shorten the machine's life, as against if they were used only for Examination paper production. He was assured that the increase in wear was of minor importance, since the machines would become obsolete before they were worn out.

Since the machinery would be provided as part of the Examination improvement initiative, Dr Shrestha suggests that the papers should be printed at 'favourable' prices. This seems fair.

It was generally agreed that a short production cycle is an essential part of maintaining confidentiality – the longer the production process, the greater the risk of leakage. Therefore the machinery should be of a sufficiently high capacity to:

- a) cope with the present quantity of papers in the shortest possible time
- b) maintain this ability when the load increases over the next year or so

Clearly there is a balance to be struck here. Sufficient machine capacity to print the quantity needed in a couple of days would be ridiculously costly. Conversely, a single machine would take far too long, and would, in any case, rapidly be overwhelmed as demand increases.

In the consultant's view, the best approach would be the use of conventional printing and binding machines, of the type already in use at JEMC; together with some sort of rapid-response alternative; this would take the form of a fast turnaround printing press, for use in situations where relatively small numbers of papers might be needed very rapidly – as in the case of last-minute changes, or suspected leaks.

## APPENDIX IV

### AN ESTIMATION OF THE EQUIPMENT REQUIRED

	<b>Same no. of pages as 2001</b> <i>+ 20% increase in quantity</i>	<b>No. of pages doubled</b> <i>+ 20% increase in quantity</i>
Pre-press	2 Macs 1 x camera 1 x printing-down frame 1 x plate processor 1 x imagesetter (polyester plates)	2 Macs 1 x camera 1 x printing down frame 1 x plate processor 2 x imagesetters (polyester plates)
Printing	1 x SRA2 perfector* 2 x small format presses	2 x SRA2 perfectors* 3 x small format presses
Folding	1 x SRA2 folder (with slitters + gluer) 2 x small format (4pp) folder	2 x SRA2 folders (with slitters + gluer) 2 x 4pp folders
Wirestitching	2 x 2 station wirestitcher	2 x 4 station wirestitcher
Trimming	1 x programmatic guillotine SRA2*	2 x SRA2 programmatic guillotines*
Numbering	2 x high-speed numbering device	3 x high-speed numbering devices
<b>Approx. Total cost</b>	£370,000	£700,000
<b>Approx. Annual Power cost</b>	£ 8,500	£ 16,000

#### Notes re above

Although a 15 year time-scale was requested, this is unrealistic. A 2 year time horizon has been taken.

Units marked \* will need 3-phase electricity supply – and all electrical supplies should be stabilised.

Small-format, fast-turnaround presses are proposed, in preference to high-speed photocopiers, because although the initial cost is slightly higher, the running-costs will be lower, and the reliability greater.

A further consideration might be the use of a suitable mini-web in place of the SRA2 perfector(s), which would reduce the printing time and eliminate the need for some of the folding capacity. However, there are no comparative costs available at the moment – this may be looked into later.

In addition to the list of plant above, a secure storage area, within the secure unit, will need to be racked-out, and a suitable pallet truck installed to handle stored materials.

It is assumed that OCE staff will continue to packet papers for dispatch to individual centres. This process should take place within the secure unit at JEMC, and space must be made available to accommodate this.

NB The costs above do not include any allowance for alterations to buildings etc. – it is assumed that this matter will be dealt with by JEMC. Nor is there any provision for materials; these should form part of the price quoted by JEMC for the production of the papers.