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PROMOTING INDUSTRIALISATION

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PROMOTING INDUSTRIALIZATION

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When the first nuclear power programme is decided upon, automatically the country has to initiate in parallel a programme to *modify* or *add* to its current industrial structure and resources. The extent of this new industrialisation depends upon many factors which both, the Government and the Industries have to consider. The Government has a vital role which includes the setting up of the background against which the industrial promotion should take place and in many cases may have also to play an active role all along this programme. Equally, the existing industries have an important role so as to achieve the most efficient participation in the nuclear programme.

Invariably the industrial promotional programme will incur a certain degree of Transfer of Technology, the extent depending on the policies adopted. For this technology transfer to take place efficiently, both the donor and the receiver have to recognise each other's legitimate ambitions and fears. The Transfer of Technology is a process having a high human content and both donor and receiver have to take this into account. This can be further complicated when there is a difference in culture between them.

Technology transfer is carried out within a contractual and organisational framework which will identify the donor (licensor) and the receiver (licensee). This framework may take various forms from a simple cooperative agreement, through a joint-venture organisation right to a standard contract between two separate entities. Each arrangement has its advantages and drawbacks and requires investment of different degrees.

One of the keys to a successful industrial promotion is having it carried out in a timely fashion which will be parallel with the nuclear power programme.

Experience in some countries has shown the problems when the industrialisation is out of phase with the programme whilst in other cases this industrialisation was at a level and scale unjustified.

INTRODUCTION

This presentation, for the sake of brevity, will consider only the "front-end" of the Promotion of Industrialisation. This "front-end" is in fact the most critical period for Industrialisation as would be the case in the gestation of any dynamic organism or set of activities. We will therefore look at the considerations normally made so that the "train" of Promotion of Industrialisation is put on the right track, heading in the right direction at the right speed. The rest should follow if the plan of promoting Industrialisation was well thought out and organised.

THE "FRUITS" OF SUCCESS

Before looking at the Promotion of Industrialisation, it is useful to look at the reasons as to why we would want to industrialise further the existing Industry whilst taking advantage of a nuclear power plant programme. A successful industrialisation will achieve on a country wide basis:

- Increased employment; some of this increase will terminate at the end of the programme and some should be permanent. The intent naturally will be to maximise the permanent part.

- Upgrading of certain sections of the existing workforce so that its output has a higher sales value.

- Imports of certain materials, equipment or services are reduced, so helping in the external trade balance and leading to greater political and industrial independence.

- The internal economy of the country is increased thus improving the purchasing power of the individual. (Obviously "overheating" the economy must be controled).

- There may be an opportunity to turn an economically depressed area in the country around into a developing and stronger economical area.

On the other hand, at the level of Industry, a successful promotion of Industrialisation will have also achieved that:

- Certain industries will have expanded and upgraded their capabilities and capacities.

- A few new industries may have been created.

- The greater financial rewards to the Industry generated will in turn lead to higher investments, higher R & D and higher rewards to the workforce.

FACTORS TOWARDS SUCCESS

To have a good chance of meeting some of the objectives it is important to assess accurately the extent to which a country and the Industry can take advantage of a N.P.P. programme and have some of this advantage on a permanent basis. Because of the magnitude and importance of realising even just one N.P.P., the Industry alone or the Utility on its own cannot maximise this industrialisation. The promotion of the Industrialisation is the result of a concerted and coordinated set of policies and measures taken by :

- The Authorities planning the N.P.P. programme.
- The Utility that will operate and maintain the plants.
- The industry as a whole as well as its components.
- The Educational and Training Authorities or Institutions who will be asked to supply some of the specialised skills and know-how to the N.P.P. programme participants through the people it will educate and train.

A further important contributor to successful Industrialisation is the degree of realism. An over-pessimistic approach will result in lost opportunities. However, if careful close monitoring of the programme is carried out then this will detect such over-pessimism and corrective action can then be taken before too much harm is done.

An over-optimistic approach will usually result in lost money and lost time and there will be later unemployment due to excessive investment in areas or industries which just were not appropriate. It is difficult to say which approach is more harmful to the country but in most cases, the greater of the two evils is probably being over-optimistic.

The realism referred to applies not only to the quantitative aspect of industrialisation such as the money invested, the capacities aimed at and so on, but also applies to the "speed" at which industrialisation should take place. Going too slow or too fast have each their dangers. However if one should err on one side, then this should perhaps be going a "little too fast". The basic reason is that putting into place an industrialisation programme, because of its size, complexity and the inevitable "importation" of some elements to the programme will be subject to some slippage. Therefore a slightly faster schedule will cushion some of this slippage.

A final major factor for a successful promotion of Industrialisation is having a monitoring system or control of the promotional part as well as the industrialisation itself. This is a delicate but vital function if we are to avoid "negotiating blind" in this complex industrialisation process.

DETERMINING THE FACTS AND THE OPTIONS

When promoting Industrialisation we have to determine at the start certain facts and in the light of the facts establish what would be the most achievable objectives of industrialisation. Finally knowing what we have to achieve, we develop a plan which will promote the industrialisation towards the set objectives or targets.

The first important step therefore is determining what goes into the N.P.P. programme in the form of materials, equipment and services. This assessment as to what goes into a typical nuclear plant can be very revealing. The supply of "non-nuclear" services and materials only can in themselves be a significant booster to the existing industries and this without the problem of upgrading the existing technology or importing new technology. Thus the supply of non-nuclear cement, nails, bolts, non-nuclear piping or structural steel, ordinary electrical and instrumentation materials may be solid reasons to increase the capacity of existing industries. As there will be a guaranteed demand over several years this allows the industry to improve their productivity which, in turn, may render the Industry concerned more competitive on the export market.

The second vital step is to assess what the industry can supply in its existing state with the available resources both in materials and in workforce. The form in which this assessment is prepared should follow the same form as in the first step with the determination of the "needs". This will then make the next step of "matching up" so much easier.

The next step is perhaps the most critical one in defining the objectives of the Industrialisation, which is the "matching-up" of the needs with what is available or could be reasonably available. This "matching" process is often carried out by considering four basic scenarios.

- What can be supplied with the existing technology and with the existing industries. Just increasing existing capacities can be included in this scenario. This will concern the strictly non-nuclear materials, equipment and services.

- What can be supplied with the existing Industries with relatively minor upgrading of their capabilities such as carrying out physical modifications to existing facilities and setting up training of personnel in higher or new technologies. This will concern materials and services which do not incorporate any nuclear technology but have to be produced to a higher level of quality due to the fact that they are destined for a nuclear plant.

- What can be supplied but which will require major modifications to the existing Industries. This latter scenario will concern itself with the "nuclear" material and services and involve major technology transfers.

- What is necessary in the operation or maintenance of the nuclear plant taking into account only the usual "expectable" situations wherein having the specialised nuclear service or material available within the country will avoid a minor operational breakdown turning into a major costly plant shutdown.

Obviously these scenarios will also be expressed with the time dimension so that we can appreciate what is required and how much starting from a certain date and finishing at another with a peak somewhere between these two dates. In certain cases the need becomes a long-term one because of the fact that the N.P.P. programme is either extended over more than say 10 to 15 years or it is an operational and maintenance need. Considerations of the time element

of the "needs" will also be affected by the "pay-back" period of some of the investments to be made. If the pay-back period is relatively short then this will be favorable to industrialisation, all other things being equal.

THE CONSEQUENCES OF THE CHOSEN SCENARIOS

Having accurately defined these basic scenarios, the next step is to evaluate what each requires in modifications and additions to the existing facilities and at which speed these facilities have to be realised, what additional resources will be needed in terms of workforce, materials, space and technology and the extent of the finances needed. In addition, have to be defined and evaluated the infrastructures needed to support the additional Industrialisation; This will concern such items as telecommunications, road and rail transportation, educational and training facilities and so on.

TECHNOLOGY TRANSFER

Invariably the industrial promotional programme will incur a certain degree of Transfer of Technology, the extent depending on the policies adopted. For this technology transfer to take place efficiently, both the donor and the receiver have to recognise each other's legitimate ambitions and fears. The Transfer of Technology is a process having a high human content and both donor and receiver have to take this into account. This can be further complicated when there is a difference in culture between them.

Technology transfer is carried out within a contractual and organisational framework which will identify the donor and the receiver. This framework may take various forms from a simple cooperative agreement, through a joint-venture organisation right to a standard contract between two separate entities. Each arrangement has its advantages and drawbacks and requires investment of different degrees.

INCENTIVES TO INDUSTRIALISATION

Another factor that will go towards a better promotion of Industrialisation is a consideration as to the incentives that central and local governmental authorities could offer to the various participants so that it is attractive for them to participate in the industrialisation process. These incentives can take many forms such as fiscal measures, soft loans, easier land purchases, special transportation rates, building extra or better adapted educational and training centres etc...

THE EXPERIENCE OF OTHERS

A final consideration that will be most worthwhile before making any decisions and defining the Industrialisation Plan is to look at other countries and check their experiences. Learning from mistakes though highly instructive can be very costly in terms of time, money and lost alternative opportunities. However to carry out this review most effectively it is important to compare as much as possible "apples" with "apples". In other words, this comparison should be with countries having similar "profiles" as one's own country. This profile has to be in terms of level of industrialisation, level of technologies, human and materials resources, geography, socio-economic structures etc... In any case, careful interpretation and extrapolation has to be made to avoid erroneous deductions.

RISKS

As with all ventures, there are risks in undertaking them. This is also the case in the promotion of Industrialisation. Thus a good evaluation of the risks of the promotional process itself and the resultant Industrialisation needs to be effected followed by an assessment as to the countermeasures if any, to be taken. The Central Authorities or Government can play an important role in this area and can help in different ways. However the two most fundamental risks that any Industrialisation programme faces are that the N.P.P. programme is slowed down or that it is just stopped momentarily or permanently. The Governmental Authorities therefore have to reassure the Industry that these two risks are negligible and if they should come about, there will be a compensation of a kind.

CONCLUSION

In conclusion, if one were to select two factors that contribute most to a successful Promotion of Industrialisation, then these would be the degree of realism of the Industrialisation aimed at both in content and in timing and the close monitoring of the Promotion process so that it is realised efficiently and as planned and is not out of phase with the needs of the N.P.P. programme.