

Necessity is the mother of fabrication too

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Cut through the hype on the Indo-US nuclear deal, and all you have is the possibility of a marginal contribution to our nuclear energy generation. For this, our strategic interest is being mortgaged in perpetuity

India's uranium deposits are limited and of low grade," Hindustan Times declared on December 12, 2006, in a large, prominently displayed, boxed item. "The uranium available today can fuel only 10,000 reactors..." Ten thousand reactors? The total number of commercial reactors in the entire world today is just four hundred and forty. With uranium enough for 10,000 reactors, are we short of ore?

In the same account, we were instructed that "the nuclear deal can save us from the increasing energy deficit by helping install up to 40,000 MW of new nuclear capacity by 2015." Assuming reactors that generate 500 MW each — the size of our new experimental fast breeder reactor, double the size of several of our current reactors — that would mean eighty new reactors being commissioned in the next eight years: that is, one new reactor coming into operation every five weeks.

The account proceeded to declare that India's "nuclear electricity capacity" shall "see a 10-fold increase" by 2020. The account noted that at present we are producing 3,310 MW electricity from our nuclear plants. The paper's forecast would, therefore, mean that electricity generation from our nuclear plants will increase to 33,100 MW by 2020. Assuming a plant-load factor of even 80 per cent — a third higher than the one at which our plants are working today — to generate this quantum of electricity, would entail setting up a capacity for over 40,000 MW.

Even in its most optimistic forecasts — and we will have occasion to learn a bit about these soon enough — the Department of Atomic Energy has been putting the figure at half that level!

But that was not the end. Polishing up the deal further, the Hindustan Times informed its readers that by 2050, an astronomical "200,000 MW of nuclear energy can be produced". We would presumably have more reactors by then than the whole world has today. As my friend T.C.A. Rangachari once said, "Jo hyper-bole so nihal."

This has been one of the main strengths of the government over the past two years — the utter innumeracy of our media exceeded only by its utter willingness to put out anything. "Killer amendments dropped, India's concerns taken care of," the papers proclaimed — when, in fact, as even the most cursory glance would have shown, each and every one of the clauses was very much a part of the Act. "Objectionable clauses non-binding," they proclaimed — when, in fact, neither our government nor that of the US was able to furnish any list of which clauses were binding and which were non-binding, and, of course, the Act itself made no such distinction.

But the enthusiasts had a ready reason for not studying the Act! "Laden with numbing bureaucratism and legalese," The Times of India declared on its front page, in its — what else should one call it? — "analytical report" of the Hyde Act on December 9, 2006, "littered with sections, sub-sections, clauses, sub-clauses and footnotes, it has enough statements, caveats and requirements to make heads spin".

How much easier then to just concoct! For it isn't the precise figure that propagandists count on remaining in the mind, nor the precise assertion but the general impression — in this case, that the nuclear deal will light up the bulbs, that the concerns which had been expressed have been met. How much easier to abuse: those who were pointing to the provisions of the US legislation were charged with being "obsessed with clauses

and sub-clauses”, to be “anti-deal jihadis”. And to put out stories, ‘Advani softens’ ‘Rajnath says if concerns met...’ I had attended every single meeting of the BJP leaders at which the nuclear deal was deliberated upon. At no meeting at all had the leaders felt that either new evidence or new argument had surfaced which required that the assessment be changed. And yet, ‘BJP softens...’ And this after written statements were put out repeatedly over the signatures of the principal leaders themselves.

The press, of course, has been the instrument in all this — that itself is as deplorable as it is worrisome. The wielder of the instrument has been the government. And its fabrications can fill a volume.

The myth of power

As the desperation to justify the deal has swelled, in the government’s reckoning the contribution that nuclear power can make to our energy needs has swelled!

In the Approach paper to the 11th Five Year Plan, which was put out with the usual fanfare in December 2006, the word ‘nuclear’ occurs just twice. The first time is in the context of housing: we are instructed that, along with growing numbers, nuclear families are creating the need for more housing. The second time it occurs is just to state that policies must be evolved to ensure swift completion of hydro and nuclear projects.

But by the time we get to the Report of the Working Group on Power for Eleventh Plan (2007-12), which was put out in February 2007, imagineering takes over the Planning Commission and its experts. The report notes that nuclear capacity at the end of the 10th Plan is liable to be 3900 MW. Reviewing the projects that can be completed in the 11th Plan, the report concludes that capacity addition during the 11th Plan (that is, by 2012) shall be 3160 MW. And then comes a sudden leap: the report says that during the 12th Plan (that is, between 2012 and 2019), 13,500 MW of capacity shall be added.

Pause for a moment and ask, how has this figure — of 13,500 MW — been arrived at? One explanation is, of course, generic: the more distant the date for which you are putting out a figure, the more daring you can afford to be! The second is specific to the figure. You see, when asked what it can aim at for 2020, the Department of Atomic Energy has been in the habit of saying, almost as a reflex, ‘20,000 MW’. Hence, the working group figure: our present capacity is for 3900 MW; add to that what can be constructed at best during the 11th Plan: that makes, 3900 MW plus 3160 MW, that is 7060 MW. To jack the figure up to 20,000 MW by 2020, 13,000 MW or so will have to be added in the 12th Plan. So, that is what we will declare as added! QED!

But assume this sudden leap is executed in the 12th Plan. Another document tells the tale the government has conjured up because of the deal. This government’s main study on the energy sector has been the report of another committee set up under the overall rubric of that habitual legitimiser, the Planning Commission. The committee had the usual stellar cast. Its report is entitled Integrated Energy Policy and was put out by the Planning Commission in August 2006. At page 37, in Table 3.4, the report gives two sets of possible figures for installed capacity of nuclear power — a set for a ‘pessimistic scenario’ and another set for an ‘optimistic scenario’. The capacity for 2020 in the former is put near the usual DAE figure, 21,000 MW. Under the ‘optimistic scenario’, it is put at 29,000 MW — far higher, you will recall, than even the working group figure, but still not so high as to sell the deal. To locate the sabz bagh in the name of which the government has been marketing the deal, you have to look at the figures for 2030: 48,000 MW in the ‘pessimistic scenario’ and 63000 MW in the ‘optimistic scenario’.

That the credulity of even the authors of the report was being strained is obvious from the note they add to this table. They record, “These estimates assume that:

- “the FBR (Fast Breeder Reactor) technology is successfully demonstrated by the 500 MW

PFBR (Prototype Fast Breeder Reactor) currently under construction,

- “new uranium mines are opened for providing fuel for setting up additional PHWRs (Pressurised Heavy Water Reactors),
- “India succeeds in assimilating the LWR (Light Water Reactor) technology through import and develops the Advanced Heavy Water Reactor for utilising Thorium by 2020.”

Anyone who has the least familiarity with what the Times of India would have called ‘bureaucratise’ will see through to the extreme skepticism that the authors — heavily pressurised reactors, if I may say so — are trying to convey. By the time three pages have passed, the pressure has taken the better of the reactors: in listing “some energy supply scenarios for 8 per cent GDP growth”, they go for “maximum nuclear”, which they say “assumes nuclear development as per the optimistic scenario of Table 3.4.” The “pessimistic scenario”? Press “Del” for delete!

That apart, what would we have to do to get from 20,000 MW in 2020 to 63,000 MW by 2030 — that is, how do we add 43,000 MW in 10 years? If we put up 500 MW reactors, that will require that we put up over 80 reactors in 120 months: that is, we bring into operation one reactor every one and a half months; if we put up 1000 MW reactors, that will require over 40 reactors — that is, we bring into operation one reactor every three months.

But take one more leap of faith.

Assume that the reactors are set up at this pace. What do we get at the end?

The report states, “Even if a 20-fold increase takes place in India’s nuclear capacity by 2031-32, the contribution of India’s nuclear power capacity to India’s energy mix is also, at best, expected to be 4.0 to 6.4 per cent.” (Integrated Energy Policy, Volume I, xxii.)

Notice what the experts are saying:

- Even if —
- There is a twenty-fold increase
- The contribution to capacity — not to actual generation
- Shall at best be....

For this marginal contribution, indeed for the possibility of this marginal contribution, our strategic interest is being mortgaged in perpetuity.

While the government peddles the deal as the magic lamp that will, as the papers have been putting it, “end the nuclear winter”, which will open “the nuclear trove”; while the government peddles the deal as the master-stroke that will ensure “energy security”, the government’s principal document on energy acknowledges the obvious: “If the sanctions by the NSG (Nuclear Suppliers Group) are removed and India is able to import uranium and nuclear power plants, nuclear power can play a much bigger role in the power sector. The capacity growth then would not be constrained by Table 3.4. However, if energy security concerns are our primary driver towards nuclear (sic), then imports of LWRs (Light Water Reactors), even though more economical, may have to be limited to restrict our dependence on energy imports.” (Integrated Energy Policy, p. 48.)

Alternatives

Contrast this contribution with just three of the many alternatives that are available. Citing an Asian Development Bank study, Integrated Energy Policy states (on p. 81) that demand-side management has the potential for affecting a peak saving of “at least 15 per cent of total generation”. The report lists several methods by which these “megawatts” may be secured — every megawatt saved is a megawatt generated. In fact, I am instructed by Commission staff themselves, this is the order of saving that comes about merely from the adoption of more efficient end-use appliances. The correct figure of this potential is not 15 per

cent but 19 per cent to 22 per cent: this is the difference between the efficient and inefficient energy scenarios projected on pages 48-49 of the report.

Consider a second alternative. The working group on power itself indicated that the potential of hydro power in just our northeastern states is 58,000 MW.

Add to this what can be secured through partnering with Nepal. The current cost of a reactor — a cost that is bound to leap higher, as we shall see — is around \$2.5 billion per reactor. For generating the 35,000 MW that the government's representatives had mentioned in Parliament, we will have to spend \$91 billion. For those mythical 63,000 MW, mentioned by the Planning Commission's Integrated Energy Policy, we will have to spend \$158 billion. Now, the total budget of the government of Nepal is about \$1.6 billion. You could offer to defray the entire budget of the Nepalese government for 60 to 100 years, and invite it to together build a string of hydro power projects with money raised from the market, and you will still come out better: you would have got power from a perennial, renewable source; you would have alleviated the problem of floods in UP, Bihar and the rest; you would have converted a neighbour into a friend.

But that is just half the story.

The fabrications of government

Wednesday, December 12, 2007

If energy security is what we are after, shifting to power dependency on imported technology, reactors, components, uranium, each of which is controlled by an even tighter cartel than oil, is hardly the answer

Explaining his assessment about the cost at which nuclear power would be available, the

prime minister told the Rajya Sabha on August 17, 2006, "Arun Shourie asked me what calculations I have seen. I have seen many calculations in the Department of Atomic Energy. In the eighties when K.C. Pant was the chairman of the energy policy committee, a detailed study was done and it was shown that if you are talking of generating power and reaching it to a place 700 km away from a coal mine, nuclear energy is the right economic answer. Things can change. And I think the Planning Commission has done recent work, and they have also come to the conclusion that having the nuclear option is something which will give us a greater degree of security on the energy front."

Actually, if energy security is what we are after, shifting from power dependent on imported oil to power dependent on imported technology, imported reactors, imported components, imported uranium, each of which is controlled by an even tighter cartel than oil, is hardly the answer. And, as we saw, even the Planning Commission's Integrated Energy Policy acknowledges this.

As for some study done in the 1980s, the price of uranium used to be \$7 per pound then. It is over \$140 per pound today.

The change of much greater consequence relates not to the price of uranium, but to that of reactors. The US has not placed an order for a new reactor since 1978 — and that order was cancelled. The last order for a reactor was placed in 1970 — and it took 26 years for that reactor to come into operation. With this attenuation of demand for reactors, the capacity of the US nuclear industry today to build reactors is very limited. By contrast, see what that industry has to do just in the US in the coming years. The MIT report, *The Future of Nuclear Power*, 2003 — as well as the study by the University of Chicago published the following year — had already established that energy from nuclear sources would be one and a half times to twice as costly as that from coal and gas. Since then an all-important consideration has been the focus of analysis. The US has a total of 103 commercial reactors today. The original

licensed life of US reactors used to be 40 years. This life has been extended for forty-odd of these reactors for 20 more years. Even with that having been done, every single reactor of the US will have to be replaced by 2056. Other countries too have plans to build reactors. Given the extremely limited capacity to build reactors, the price that will be charged by vendors is bound to leap up. (A recent study published in April 2007 by the most influential organisation on US foreign policy gives a succinct and authoritative account of the prospect in this regard: Charles D. Ferguson, Nuclear Energy, Balancing Benefits and Risks, Council on Foreign Relations, April 2007.)

What of "recent work" by the Planning Commission that the PM mentioned? The most recent one is the Report of the Working Group on Power, which the commission published as recently as February 2007. The working group lists the cost per megawatt for generation projects. The report places the cost at Rs 4 crore per megawatt for coal based projects; Rs 3 crore per megawatt for gas based projects; Rs 4.50 crore to Rs 5 crore per megawatt for run-of-the-river hydro projects; Rs 5.50 crore to Rs 6 crore for storage hydro projects. And for nuclear power projects? Rs 6.50 crore per megawatt. And, recall, this group was straining to pad up the necessity for nuclear power to justify recourse to the deal.

But we don't have to go just by estimates: there is an actual and current example. The new unit at Tarapur is supplying power at Rs 2.70 to Rs 2.80 a unit. What is the price per unit that has been accepted for power from the new ultra-mega thermal power project? Rs 1.19 per unit! The moment I recalled this contrast in the Rajya Sabha the other day, Dr Kasturirangan, who had just spoken in favour of the deal, interjected, "That price for nuclear energy is subsidised." Others who have studied the matter intervened, "Actually the cost is Rs 9 per unit." So, power at double or seven times the cost from other sources.

Indeed, even at these levels, these Indian estimates of the cost of nuclear power are

gross underestimates. To cite just one fact, they do not build in the cost of disposing nuclear waste. The US itself is today plagued by this problem — having spent over \$9 billion for developing a storage repository in the Yucca Mountain in Nevada, having striven for two decades to develop the site, the expectation is that the site will not become operational till 2015/2020 or so.

Nor do our estimates build in the cost of the more and more stringent and increasingly expensive security arrangements that will have to be made to prevent theft of fissile material as the number of reactors multiplies. Even countries that have exerted to the utmost to secure such material are experiencing insuperable difficulties. "The nuclear material currently unaccounted for at plutonium reprocessing facilities could make many bombs," Ferguson notes. "For example, Japan cannot account for more than two hundred kilograms of plutonium at the Tokai-mura plant. In Britain, the Sellafield plant cannot account for about thirty kilograms of plutonium. According to the IAEA, only eight kilograms of plutonium are needed to make a bomb. But even less than that was used in the Nagasaki bomb, which employed six kilograms. More advanced designs could use as little as one to three kilograms." (In addition to Ferguson's study, for an instructive analysis of all this see the oft-cited report by Brice Smith, Insurmountable Risks, The dangers of using nuclear power to combat climate change, Institute for Energy and Environment Research, Md., 2006.)

But: "I have seen many calculations in the Department of Atomic Energy. In the eighties... a detailed study was done... And, I think, the Planning Commission has done recent work, and they have also come to the conclusion that..." says the PM. And that is the end of the matter.

The fabrications in regard to uranium

The argument that we need nuclear power would not have been enough to justify the deal — for the response could have been, "All right, use domestically available uranium

to generate it." Hence, two further myths were fomented: we are woefully short of uranium; such uranium as we have is of poor quality.

The authoritative compilation on uranium supplies is what is known as the Red Book of the IAEA and OECD. The latest one — published in 2005/06 — records India's uranium reserves as being 94,000 tonnes. Of these, 64,000 tonnes are what are termed as 'RARs', Reasonably Assured Reserves; and 30,000 tonnes are EAR-I, that is, 'Estimated Additional Reserves'. Currently we are using 1,334 tonnes a year. By every stretch, these are enough to see us through to the time we will master fast breeder and thorium technologies. What is probably the best available study of the potential of these reserves, *Atoms for War?* (Carnegie Endowment for International Peace, 2006) has been done, in fact, by one of the architects of the deal, Ashley Tellis. In it, he shows that India has more than enough uranium — even if it were to aim in the coming decades at a nuclear arsenal of 2023 to 2228 weapons.

Now see how the twin myths are formented. The Planning Commission's Integrated Energy Policy states: "India is poorly endowed with uranium. Available uranium supply can fuel only 10,000 MW of Pressurised Heavy Water Reactors. Further, India is extracting uranium from extremely low grade ores (as low as 0.1 per cent uranium) compared to ores with up to 12-14 per cent uranium in certain resources abroad." Notice the sleight of words: our average — 0.1 per cent — is compared to other unspecified countries' highest, their "up to..."

The facts are more reassuring! The most important suppliers of uranium are Australia, Kazakhstan and Canada — half the world's output comes from them. The most recent account of uranium reserves, put out as recently as November 2, 2007, again by the Council on Foreign Relations, notes that it is only in Canada that the ore — about a fifth of it — is above the 1 per cent grade. "In Australia, on the other hand, some 90 per

cent of uranium has a grade less than 0.06 per cent. Much of Kazakhstan's ore is less than 0.1 per cent."

Nor has the government ever explained why we are not able to get more uranium from countries that are not members of the Nuclear Suppliers Group — Niger, Nigeria, Mongolia. Is it that we have been fixated on our traditional suppliers, like Russia? Is it that we have tried but found that, in fact, the governments of these countries are so weak that eventually they go by the dictates of multinational companies and the major powers that control the NSG itself, the US, France, Russia, China? Is it that these controllers have blocked the non-members from supplying uranium to us even as they themselves have blocked members of the NSG from supplying it? If that is indeed the case, how come we are putting so much faith in these very controllers as to place our future energy security in their hands?

That last question also arose in regard to what the prime minister said when he charged Yashwant Sinha with spreading falsehoods. Yashwant Sinha was asking why the deal with the Russians for four additional reactors had not been signed during the PM's recent visit to Moscow. Was it under US pressure? The PM said that "it had always been understood" that this agreement would be signed only after restrictions had been lifted by the NSG. That was certainly not the impression he gave in the written statement that he read out during the joint press conference that he held with President Putin in New Delhi on January 25, 2007. In that statement he thanked President Putin for the help that Russia had given in ending the international restrictions that had been placed on imports of nuclear materials by India. He pointed to the memorandum of intent that had been signed by India and Russia for the construction of four new reactors at Kudankulam. There was not the shadow of a hint that further progress was contingent on anything that was to be done by the very countries that had imposed those international restrictions. And now, suddenly, "it was always understood..."

'Why don't you believe the CEO of America instead of some undersecretary?'

The Americans have been absolutely candid in what they intend to accomplish through the nuclear deal. To halt, roll back, and eventually eliminate India's nuclear capability. To draw India into the non-proliferation regime. To have it sign up on other international protocols that the US, etc are crafting — the FMCT, the PSI, the Wassener Agreement... To make its energy supplies so dependent on imported uranium, imported reactors, that it would 'on its own' desist from testing. Provision upon provision of the Hyde Act speaks to this design explicitly. Statements upon statements of US Congressmen, Condoleezza Rice, Nicholas Burns and others testify to it.

Each time these have been cited by persons like me, government spokesmen have said, "But why relying on what some undersecretary has said? Why don't you believe what the CEO of America, President Bush himself said when he signed the Hyde Act into law — that he would not be bound by the provisions? Did he not say that he would treat these as 'advisory' — that is, they shall be non-binding — and go by his own assessment?"

It just so happened that the very morning when the debate was to take place in the Rajya Sabha in December last year, every Indian correspondent in Washington received the statement — in hard as well as soft copy — and was urged to creed it to India post haste. Jaswant Singh received it from a correspondent in Washington and gave me a copy. The use to which the government would put it, and the construction it would put on it, were obvious. So, during my speech, I mentioned the statement, and said that before the debate was done, government would be invoking it. Sure enough, the minister for external affairs didn't just invoke the statement, he read into it exactly what I had said government would. Since then, he has himself invoked it twice in Parliament, and of course sundry government spokesmen have been touting it

to insinuate that the Hyde provisions are not really going to apply.

That is typical of what the government has been doing, with full confidence that no one will read or remember the original. In fact, what President Bush said can provide no solace to anyone concerned with India's options in regard to its strategic programme.

The statement had to do only with a long-drawn tug of war between the executive and legislative in the US over who has the final say on the country's foreign policy. Sticking to the position he has taken in invading Iraq, Bush said that the conduct of foreign policy is the prerogative of the executive and so he would construe the provisions in the Hyde Act that had a bearing on foreign policy as advisory. That is little consolation for us — the provision that prescribes penalties which must befall India should it test, for instance, is NOT one of these provisions.

For the same reason, he said that the provision in the Hyde Act that lays down that should NSG guidelines prohibit the export of some item to India, the US too would desist from exporting that item to India, would entail that the conduct of US foreign policy would be ceded to some international body, and this the executive could not do under the US Constitution. What use is this assertion of presidential powers to us? The provision of concern to us is the opposite one — it is the direction to the president, repeated more than once, that when the US terminates nuclear exports to India, it shall ensure that no other member of the NSG steps in to provide those materials components, fuel, and so on to India.

The third point Bush made was about information the executive shall collect regarding India's nuclear programme. He said, the executive would not automatically disclose all of it. Again, no help to us. He did not say that the US government shall not collect the enormous amount of information about every aspect of our nuclear programme that the Hyde Act requires it to collect — including information about every bit of uranium mined, milled, used, the

power produced from it, and how much is left over for weapons, and so on. The fact is that parts of such information are collected through US intelligence agencies also. The executive does not automatically make it public. Often, it gives the information to committees of the Congress in closed hearings. How does that help us?

Nor is it that the statement does not in the least say what the government has been trying to make us believe it says. The farcical thing is that it is seeking to find solace in the fact that on provisions regarding foreign policy — say, Iran — Bush will go by his own assessment, and not be constrained by the US Congress!

And then there is the obvious point: the law is not what a president says at some signing ceremony, the law is what the US Congress has enacted. Clinton specifically set aside signing statements of President Reagan and President Bush Sr. Will the next president, or one twenty years down the line, go along with the Congress in regard to even these provisions regarding foreign policy or with Bush's statement?

Obvious. And yet the fabrication. In the full confidence that no one will read the original — even when it is as brief as Bush's statement is, just 15 lines! How disheartening that the confidence is all too often justified in regard to our media.

The moral is simple:

- Don't run after secret documents;
- Just read the printed ones;
- But do read them;
- Governments will be brought to heel.